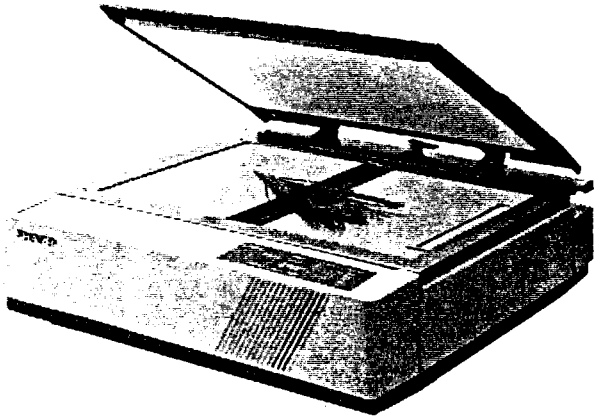
JX-450

SHARP SERVICE MANUAL

CODE : 00ZJX450SM/-E



COLOR SCANNER

MODEL JX-450

CONTENTS

I TROUBLE SHOOTING 2
1. Diagnostic program 2
2. Adjustment 6

II MECHANICAL SECTION 10
3. Mechanical description 10
4. Disassembly and assembly ... 11
4-1 Cabinet 11
4-2 Original cover unit 13
4-3 Table glass and table slider 15
4-4 Operation panel 19
4-5 Light source unit 20
4-6 Lens mount unit 23
4-7 Drive unit 24
4-8 Fluorescent lamp actuating PWB 30
4-9 Rotating mirror unit 30
4-10 SNS PWB unit 35
4-11 Mother PWB 37
4-12 Mirror 1 38
4-13 Fan 39
4-14 Control PWB 40

III PRINCIPLES 41
5. Operating principles 41
6. Operational description 54

IV DESCRIPTION OF EACH BLOCK ... 57
7. Optical system 57
8. Control system 63
8-1 Main controller 65
8-2 Timing controller 69
8-3 Analog signal processor ... 72
8-4 MTF modification 75
8-5 Tone modifier 78
8-6 Buffer memory 78
8-7 GPIB interface 78
9. Power supply 85
10. Lamp starter 88

V CIRCUIT DIAGRAM 90

VI PARTS GUIDE

SHARP CORPORATION

(FEATURES)

1. The JX-450U/V is a compact color scanner that features outstanding resolution and color reproduction performance pertinent to graphic color production.
2. Will scan a fine dot and line in the high resolution of 300 dpi (12 dots/mm).
3. Will scan color components of R (red), G (green), and B (blue) by single scan process, reproducing a document with fine contrast and hue in 260,000 colors or more through digital process.
4. Will scan a document of A3 size at a maximum.
5. Will produce toned data of R, G, and B after color correction.
6. Equipped with GPIB interface as standard, enhancing connection as an image processing system for various purposes.
7. Will scan a transparency such as a positive film and overhead projector film with the optional transparency unit in use.

(Specification)

Model name:	JX-450 color scanner
Type	Desktop
Scanning system	Moving table (allowable loaded table weight: 5kg)
Color separation system	High speed alternate activation of three fluorescent lamps (R, G, and B) in the single CCD electronic scanning mode.
Resolution	300 dpi (12 dots/mm), normal; choice of 200 dpi, 150 dpi, 100 dpi, and 75 dpi mode.
Color separation accuracy	R, G, B, 8 bits each. Guaranteed accuracy 6 bits (64 tones).
Scan area	Reflective scan mode: 297mm x 431mm Transmittive scan mode: 297mm x 210mm
Interface	GPIB(IEEE-488)
Data format	ASCII, or binary
Scanning speed	30 ms/line, max. (106 sec. for A4 at 300 dpi)
Function	Following functions can be selected by the controller: resolution, scan time, scan area, data format, data correction (gamma correction), MTF correction (edge accentuation), transfer mode, 2 tone system
Fluorescent lamp life	500 hours or more (A4 documents can be scanned 17,000 times or more at 300 dpi).
Power requirements	90~132VAC 50/60Hz
Power consumption	130W max.
Operating environments	Operating temperature: 15~30°C, Operation humidity: 20~80%RH Storage temperature: -20~60°C, Storage humidity: 90%RH max.
Physical dimensions	552 wide x 530 deep x 185 high
Weight	Approximately 25 kg
Option	CX-500T1/T3 transparency unit

1. Troubleshooting

1. Diagnostics

<How to go into the diagnostic mode>

① Turn power on.
② Set test switch and address switch as directed in Table 1.
③ It goes into the the dip switch set diagnostic mode.

<How to exit from the diagnostic mode>

① Turn power off.
② Set test switch and address switch to scanner-1 mode shown in Table 1.
③ Turn power on to go back to the normal operation mode.

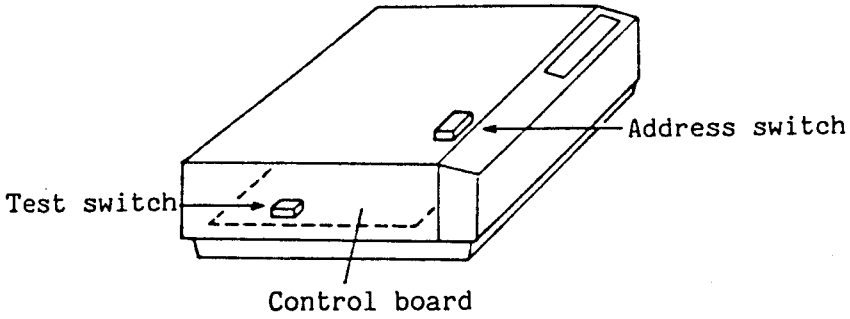


Fig.1

1-1. Diagnostic function table

No.	Mode	Test switch		Address switch						Function
		1	2	32	16	8	4	2	1	
1	Scanner-1	0	0	0	*	*	*	*	*	Normal operation
2	Scanner-2	0	0	1	*	*	*	*	*	Test data output mode Test data is sent out by receiving the V2~V6 command (see 1-1-1).
3	Board test	0	1	-	-	-	-	-	-	Control board check (see 1-2).
4	Scanner test	1	0	-	-	-	-	-	-	Checking each operational block (see 1-1-2).
5	White balance	1	1	-	-	-	-	0	0	For adjusting white balance. (Fluorescent lamp blinks at WB position.)
6	Read line adjustment	1	1	-	-	-	-	0	1	For adjusting read line. (Fluorescent lamp blinks at read line adjusting position.)
7	Table 1	1	1	-	-	-	-	1	0	Document table shifts once. (Fluorescent lamp does not activate.)
8	Table 2	1	1	-	-	-	-	1	1	Document table shifts twice. (Fluorescent lamp activates.) But read data will not be sent out.

Table 1

(Note) 0: OFF
1: ON
*: GPIB address setting
-: Not defined

1-1-1. Test data output mode (scanner-2 mode)

The test data from the JX-450 must be specified for use with the test.
Message V1 ... Read data are supplied as transmit data.
V2 ... Test data-1 are supplied as transmit data.
V3 ... Test data-2 are supplied as as transmit data.
Use the V1 message to operate the JX-450 in the normal operation mode. Use the V2 or V3 to check data transfer with the controller. When V2 or V3 is specified, the same test data are issued for a line, and the read mode setting and the operation are identical in the case of V1. This becomes valid in the test mode (address switch 32 at ON). The contents of the transmit data V2 and V3 are disclosed in the program manual, except for V4 to V6 that are not disclosed.

Message		Transmit data (hexadecimal)									
		Order	1	2	3	...	255	256	257	258	...
V2	Test data 1	R	03	03	03	...	03	03	03	03	...
		G	0C	0C	0C	...	0C	0C	0C	0C	...
		B	30	30	30	...	30	30	30	30	...
		B/W	C0	C0	C0	...	C0	C0	C0	C0	...
V2	Test data 2	R	00	01	02	...	FE	FF	00	01	...
		G	00	02	04	...	FC	FE	00	02	...
		B	00	04	08	...	F8	FC	00	04	...
		B/W	00	01	02	...	FE	FF	00	01	...

Table 2 Transmit data when V2 or V3 is specified (for one line)

(Note 1) From the line 2 onward the output contents will be the same as those of line 1.

V4~V5 are also disclosed as transmit data which are mainly used to check color representation. See Table 3 for the output data.

Message	Transmit data (hexadecimal)										
V2	Order	1	2	3	... ...						Color
	R	80	80	80	... ...						Gray output
	G	80	80	80	... ...						
	B	80	80	80	... ...						
	B/W	80	80	80	... ...						
V2	Order	1	2	3	... ...		256	257	258	... ...	Color
	R	00	01	02	... ...		FF	00	01	... ...	Tonal output
	G	00	01	02	... ...		FF	00	01	... ...	
	B	00	01	02	... ...		FF	00	01	... ...	
	B/W	00	01	02	... ...		FF	00	01	... ...	
V2	Order	1~64	65~128	129~192	193~256	257~320	321~384	385~448	449~512	... ...	Color
	R	FF	00	00	FF	FF	00	00	FF	... ...	See Note 2.
	G	00	FF	00	FF	00	FF	00	FF	... ...	
	B	00	00	FF	00	FF	FF	00	FF	... ...	
	B/W	20	40	60	80	A0	C0	E0	FF	... ...	Tonal output

Table 3. Transmit data when V4~V6 is specified

(Note 2) V6 message output pattern

1~64	65~128	129~192	193~256	257~320	321~384	385~448	449~512	... ...
Red	Green	Blue	Yellow	Magenta	Cyan	Black	White	Repeat

1-1-2. Operational check of each block (scanner in test mode)

In this mode, thermistor, sensor, and address switch are tested after checking the LEDs on the panel.

- LEDs on the panel start activating from the upper left, one at a time. (POWER→READY→ERROR ..... 75)
- Checks two kinds of thermistors, three kinds of sensors, and address switch (see Fig.2).
- LED lights up when the thermistor is normally operating.
- When the document table is manually moved, the LED corresponding to the active sensor comes activated.
- When address switch is ON, LED corresponding to active bit is activated.

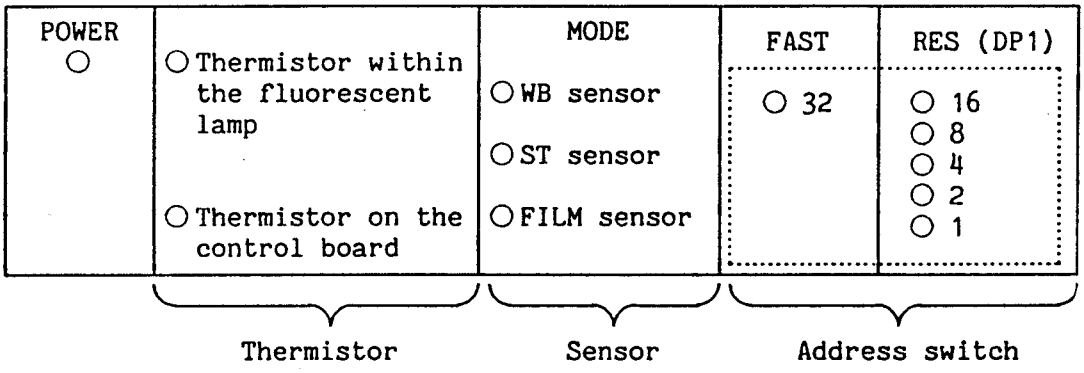


Fig.2.

No.	Error		POWER	READY	ERROR	MODE			FAST	RES					Error via. troubleshooting
						COLOR	MHT	B/W		300	200	150	100	75	
1	Command error. Buffer overflow		○	○	○	*	*	*	*	*	*	*	*	*	• Received message for device not existing. • Option setup parameter out of limit. • Option select format not correct • Buffer memory-2 R/W error • Received data above the data input buffer capacity (5117 byte).
2	Time out		○		○		○				○				• Took 10 minutes or more to transfer one line of data.
3	Address error		○		○										• Device address has been set to "31".
4	Document table feed error		○		○		○			○					• Too much time to shift the document table above 6 seconds. Check the table for overload.
5	White balance error		○		○			○						○	• Fluorescent lamp intensity out of smaller than the given value (CCD output 0.5V or above). Check power supply, fluorescent lamp for fatigue, or optical system for deviation.
6	Machine trou-ble	Power ON error													• Check POWER LED, power supply,and + 5V line on the indicator panel.
		CPU error	○												• Check the CPU for a failure in the clock, + 5V, and penpheral.
		Sum check error	○		●	○			○						• Check IC135 and its penphery (circuit diagram 1/17).
		System memory R/W error	○		●	○				○					• Check IC127 and ITS penphery (circuit diagram 1/17).
		Timing memory R/W error	○		●	○					○				• Check IC77/78 and its penphery (circuit diagram 3/17).
		Tone memory R/W error	○		●	○						○			• Check IC62 and its penphery (circuit diagram 12/17).
		Line memory R/W error	○		●	○							○		• Check IC125/133 and its penphery (circuit diagram 10/17).
		Buffer memory-1 R/W error	○		●	○								○	• Check IC49/56 and its penphery (circuit diagram 13/17).
		Buffer memory-2 R/W error	○		●	○				○	○				• Check IC8/15 and its penphery (circuit diagram 14/17).
		Data transfer error	○		●			○		○					• Data transfer error from line memory to buffer memory. • Check memory transfer block (circuit diagram 10/17~14/17) • Check I/O port selector (circuit diagram 15/17). • Chick timing circuit (circuit diagram 3/17, 4/17).
		MTF correction error	○		●			○			○				• Failure in the MTF correction circuit. • Chick IC97 and its penphery (circuit diagram 11/17).
		Tone control error	○		●			○				○			• Failure in the tonal control circuit. • Check IC62 and its penphery (circuit diagram 12/17).
		Binary error	○		●			○					○		• Failure in the binary circuit. • Check IC74 and its penphery (circuit diagram 12/17).

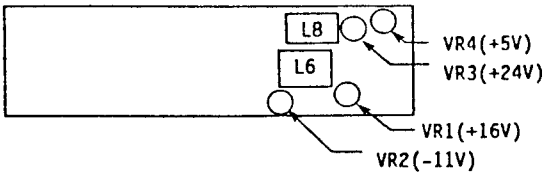
Note: If there is a tonal failure in the scanned image, check the following waveforms as shown in Fig.91.

① CCD output
② TPVO (waveform after CCD amplifier output)
③ TPSB (G component, dark component corrected waveform)
④ TPSC (shading waveform)
⑤ TPOS (ADC input waveform)

1-3. Check items

Though the JX-450 does not require periodical maintenance as a general rule, the following are to be checked when required.

- Clean mirror, table glass, and white balance board. Do not scratch mirror.
- Check for carbonization in the fluorescent lamp.
- Check CCD for proper output.
- Check the supply voltage in the white balance mode.
  +24V (24.4~24.8V)
  +5V (5.10~5.15V) See Fig.3 for voltage regulator adjusting pot.
  +16V(15.8~16.2V)
  -11V(-10.9~-11.1V)



Power supply board

2 Adjustment

Use of an oscilloscope is mandatory in order to achieve complete adjustment of the scanner optical system. If it was not available at hand, the unit has to be replaced by the new one.
It is also essential to set the scanner in the optics adjust mode in order to adjust the optical system.

There are the following two kinds of adjusting modes to adjust the optical system.

(1) White balance mode
(2) Light path adjust mode

(1) White balance mode

Power off the scanner, set off "1" of the dip switch T-SW on the control PWB, set off the address setup switch (6-position dip switch), and turn power on to go into the mode.

(2) Light path adjust mode

Power off the scanner, set on "1" and "2" of T-SW on the control PWB, set on only "1" of the address setup switch with rest of others off, and power on to go into the mode.

2-1 Scanner optical system adjustment

[Outline]

a) Light path adjustment

The main scan direction sensor is aligned parallel to the original.

b) Focus adjustment

Focus is adjusted for the lens.

c) Center adjustment

The center of the sensor is aligned with the center of the original.

[Tools required]

- Special tools, 1, 2, and 3.

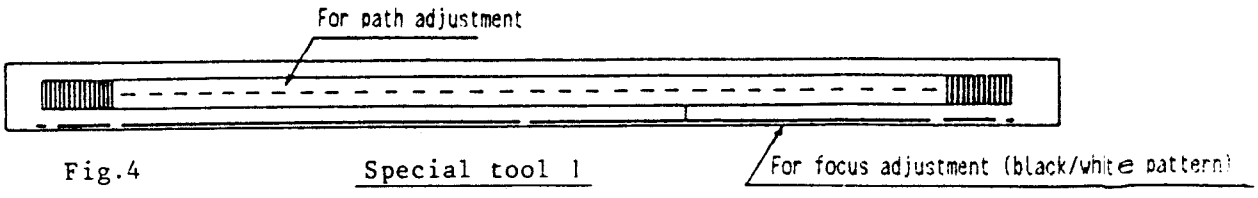


Fig.4 Special tool 1

Fig.5 Special tool 2

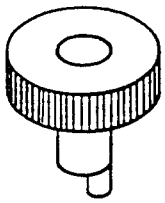


Fig.6 Special tool 3

Tool name	Description	Part code	Price rank
Tool−1	Path and focus adjustment	UKOG−7001SCZZ	BB
Tool−2	Path adjustment (only with mirror unit)	UKOG−7002SCZZ	AZ
Tool−3	Fine adjustment of lens	UKOG−7003SCZZ	BD
Extension cable−1	Control PWB↔ I/F connector	QCNW−7058SCZZ	AZ
Extension cable−2	Control PWB↔ Panel PWB	QCNW−7059SCZZ	AY
Extension PWB	Extend control PWB	CPWBX3032SC01	CM

- Standard tip screwdriver
- Phillips tip screwdriver
- Oscilloscope.
- Allen wrenches (4mm, 3mm)

2-2 Adjustment procedure

1) Remove the scanner block housings, right side cover and the left side cover.

2) Losen the CCD holder securing screw to permit the CCD holder to move by the screw ①. There should by no clearance on the sliding surfaces between the CCD holder and the lens holder. Set the CCD holder so that the bottom of the holder should be 5mm from the bottom of the lens holder.

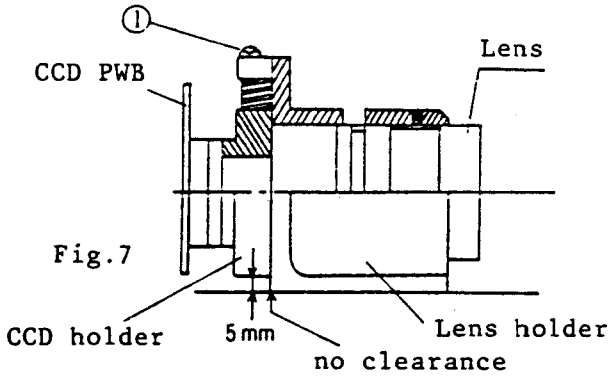


Fig.7

3) Get the oscilloscope ready for CCD waveform measurement. Connect the oscilloscope probe with the pin of the control PWB connector CN3.

Pin No.1.....trigger
Pin No.11.....CCD output
Test pin TPAG...GND

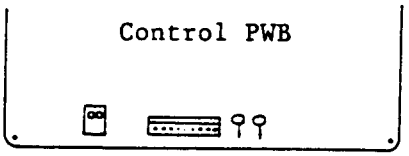


Fig.8

4) Adjust the angle of the tilt mirror in the white balance mode. Fasten the mirror stopper fingertight when the waveform shown in the figure right appeared.

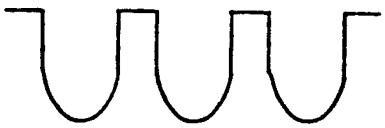


Fig.9

5) Adjust the focus using the focus matching pattern of the special tool 1. Plate the tool on the left side of the table, move the table so that the focus matching pattern should come over the scanning position, and move the lens with the special tool 3 to adjsut the focus. The CCD output waveform must appear as shown in the figure.

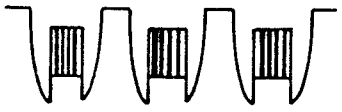


Fig.10

Insert the special tool 3 through the $\phi 8$ hole in the lens holder and have the $\phi 4$ eccentric shaft of the tip of the tool engaged with the slit in the lens. Rotate the tool to move the lens 4mm.

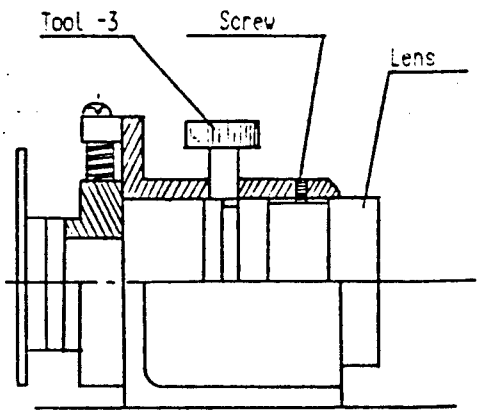


Fig.11

For there are three holes to insert the tool through, it has to chosen according to the focus rank of the individual lens.

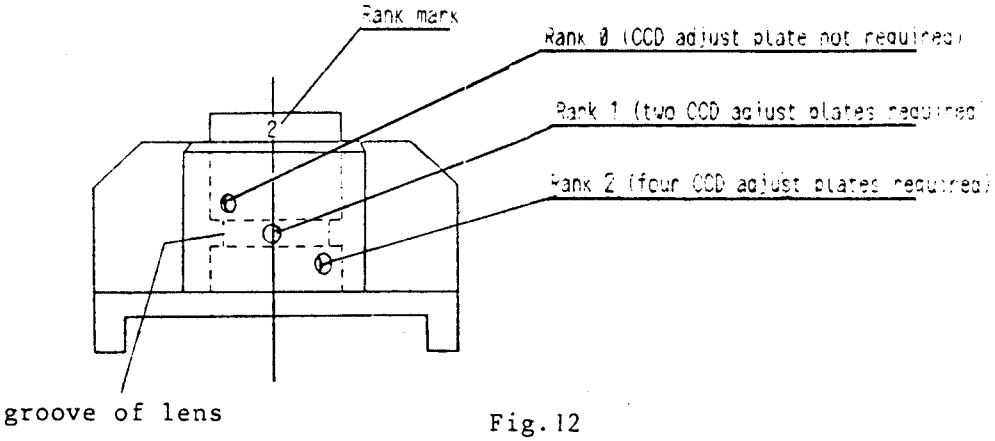

Rank mark
Rank 0 (CCD adjust plate not required)
Rank 1 (two CCD adjust plates required)
Rank 2 (four CCD adjust plates required)
2
groove of lens

Fig.12

6) Set it in the path align mode, place the special tool 1 on the left side of the table so that the black alignment line should cover over the left of the table, then adjust the angle of the tilt mirror. The CCD output waveform must be as shown in the figure.

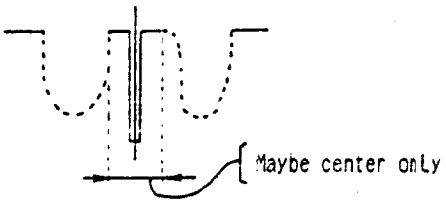


Fig.13

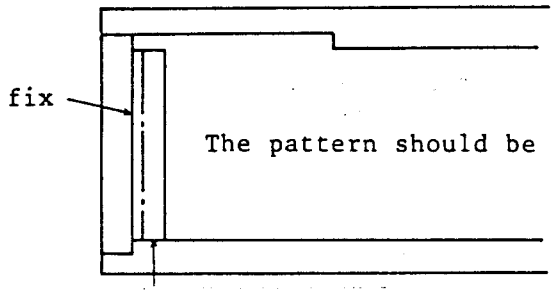


Fig.14

(How to install tool-1)

7) Adjust the tilt of the CCD PWB using the path adjusting screw of the lens block. The CCD output waveform must be as shown in the figure.

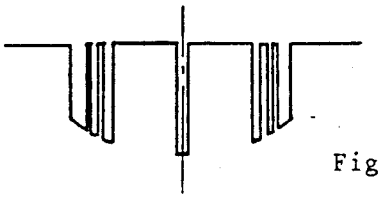


Fig.15

8) Move the table to left to the location where the CCD holder screw can be tightened from the lower right side of the lamp box using the phillips tip screwdriver. Place the light path adjusting pattern on the scan position, and have the output waveform in 7) appeared by moving the pattern, then secure the CCD holder. Pay attention not to affect the output waveform to change during the screw tightening and alternately tighten the screws.

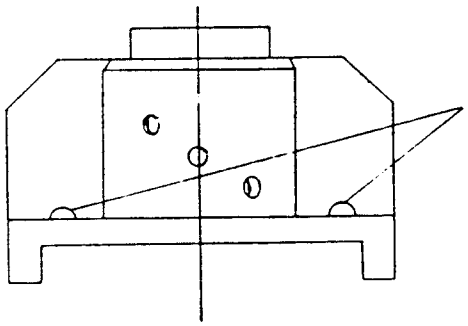


Fig. 16

9) Use the special tool 1 in the light path adjusting mode, place the path adjusting pattern on the left side of the table, and move to adjust the whole lens unit so that only the 150 dpi indicator should come active on the RES indicators on the panel.
If all the RES indicators should come active, start the adjustment from step 6) all over again.

10) Set on the mirror option unit (CX500T1/T3), place the special tool 2 on the left side of the table, and adjust the tilt mirror angle in the white balance mode so that the CCD output waveform shown will appear.

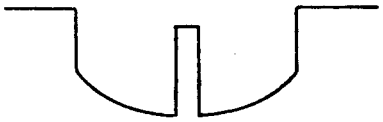


Fig. 17

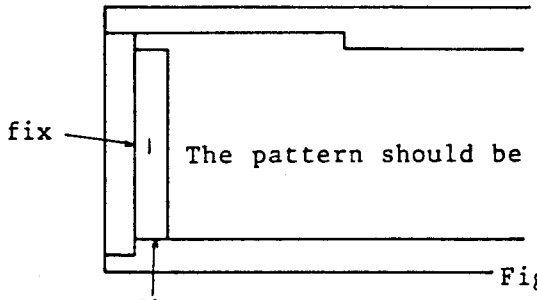
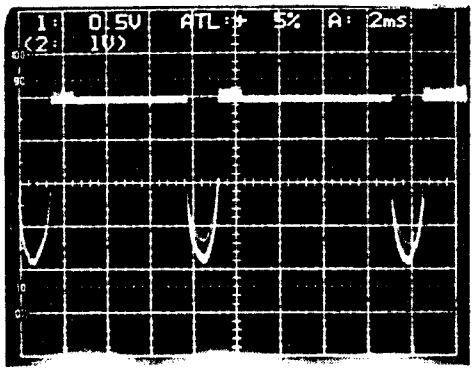


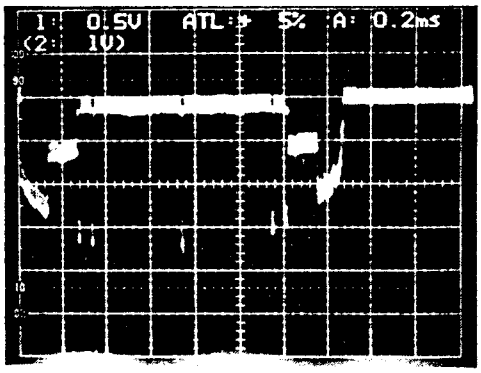
Fig. 18 (How to install tool-2)

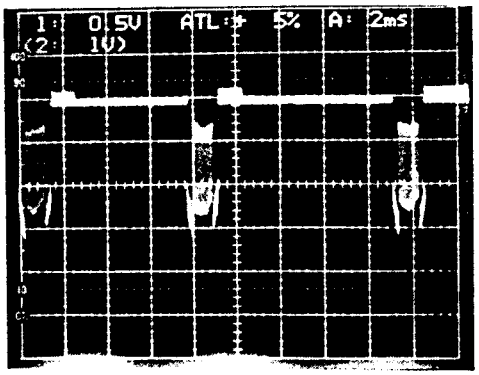
11) Check the CCD outputs at every step above.

white balance

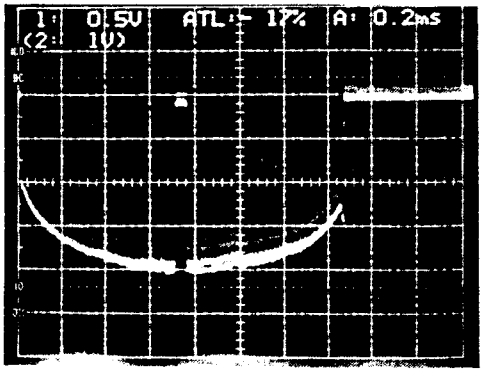


pass adjustment





focus



pass adjustment
(with mirror unit)

Fig. 19

II MECHANICAL SECTION

3. Mechanical descriptions

The JX-450 can be divided into the following sub-sections.

3-1. Table glass drive mechanism

Table glass drive mechanism

The table glass drive mechanism moves the optical system step by step to scan the original placed on the table glass.

A pulse motor is used to drive the mechanism. Rotation of the pulse motor drives the drive pulley connected to the idle pulley with the timing belt and the drive wire wound ground the drive pulley moves the table glass.

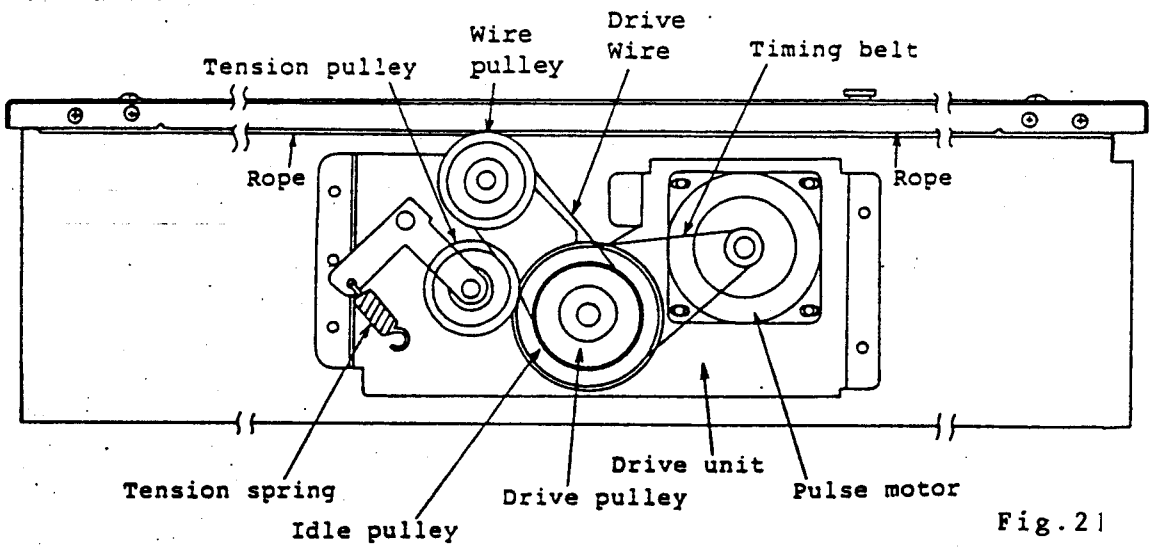


Fig.21

Constant tension is added to the drive wire by means of the tension spring and the tension pulley.

3-2. Rotating mirror unit

The rotating mirror unit is used to change the direction of the light path when the mirror unit is mounted.

When the mirror unit holding axle is pushed down by the lever spring, the mirror rotates so that the light from above is sent to the CCD unit.

(1) Normal condition

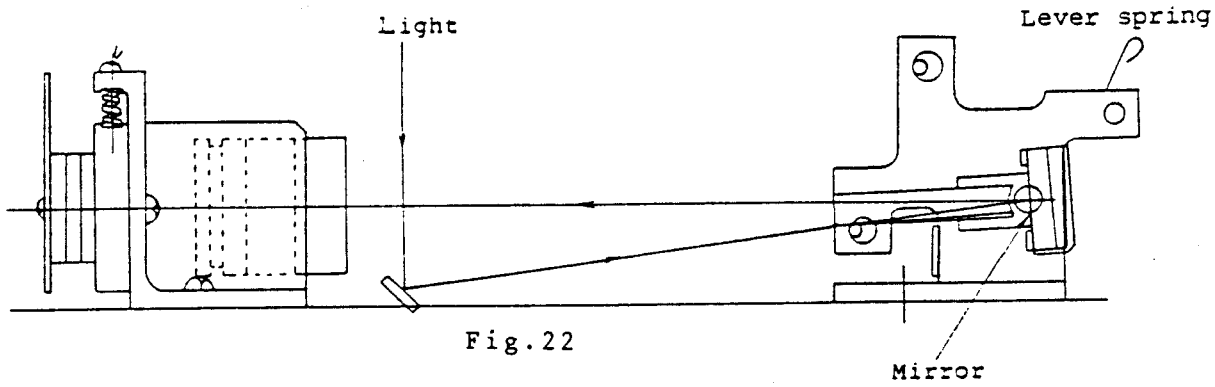


Fig.22

(2) When the mirror unit is installed.

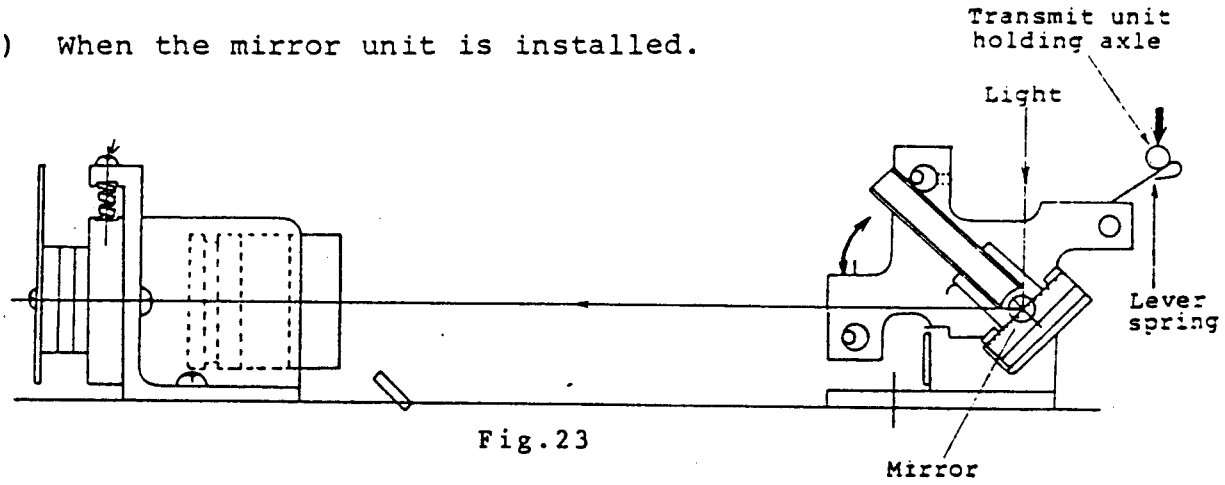


Fig.23

4. Disassembly and reassembly

NOTES:

- This section describes the disassembly and reassembl- procedures for components that may be replaced during machine maintenance. However, a description is omitted for replacement procedures that do not require a special technique or attention.
- This section mainly deals with disassembly procedures. Except for special attention required during reassembly, descriptions are omitted for the reassembly procedures. Observe the reverse sequence of disassembly in reassemb- ly the components.

4-1. Cabinet (Fig.24)

a. Remove the two screws ① in Fig.24 and remove the front cabinet ②.

b. Remove the two screws ③ in Fig.24 and remove the rear cabinet ④.

c. Remove the two screws ⑤ in Fig.24 and remove the left cabinet ⑥.

d. Remove the two screws ⑦ in Fig.24 and remove the right cabinet ⑧.

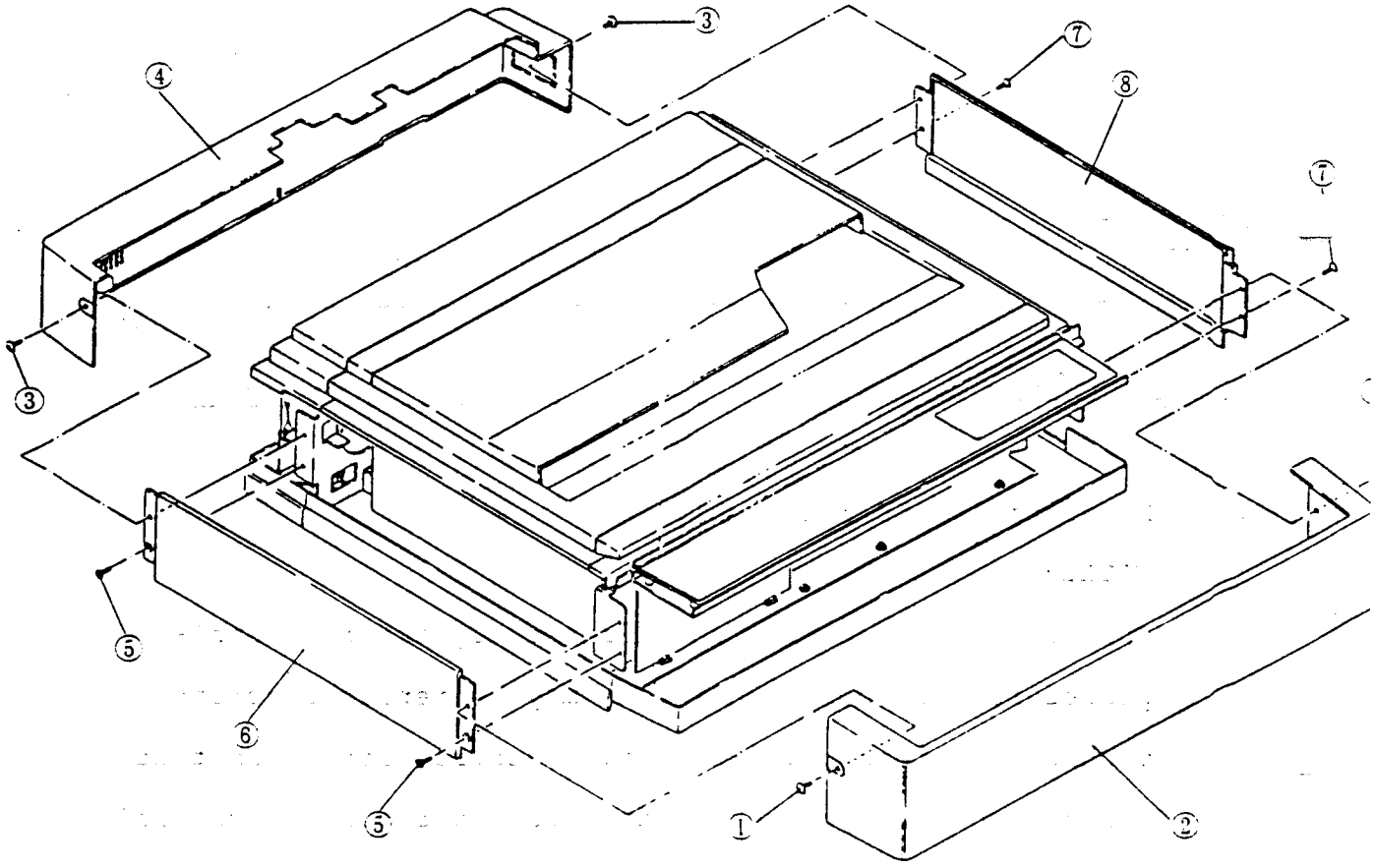


Fig.24

4-2. Original cover unit

a. Lift up the original cover hinge holder ① in Fig.25 and remove the original cover unit ② from the rear glass support plate ③.

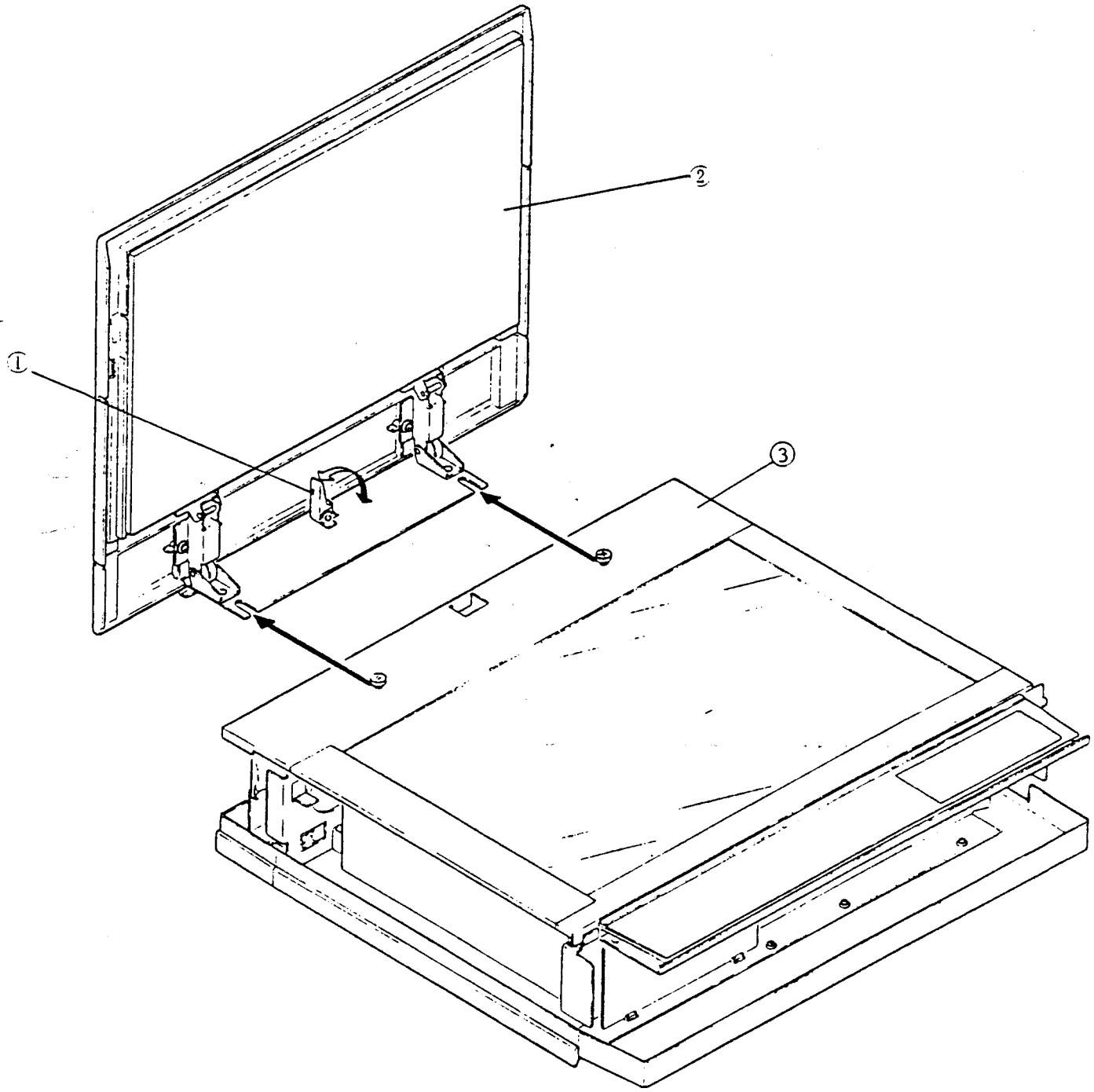


Fig.25

b. Remove the four screws ① in Fig.26 and remove the large original cover ②.

c. Remove the four screws ③ in Fig.26 and remove the small original cover ④ and the original cover hinges ⑤.

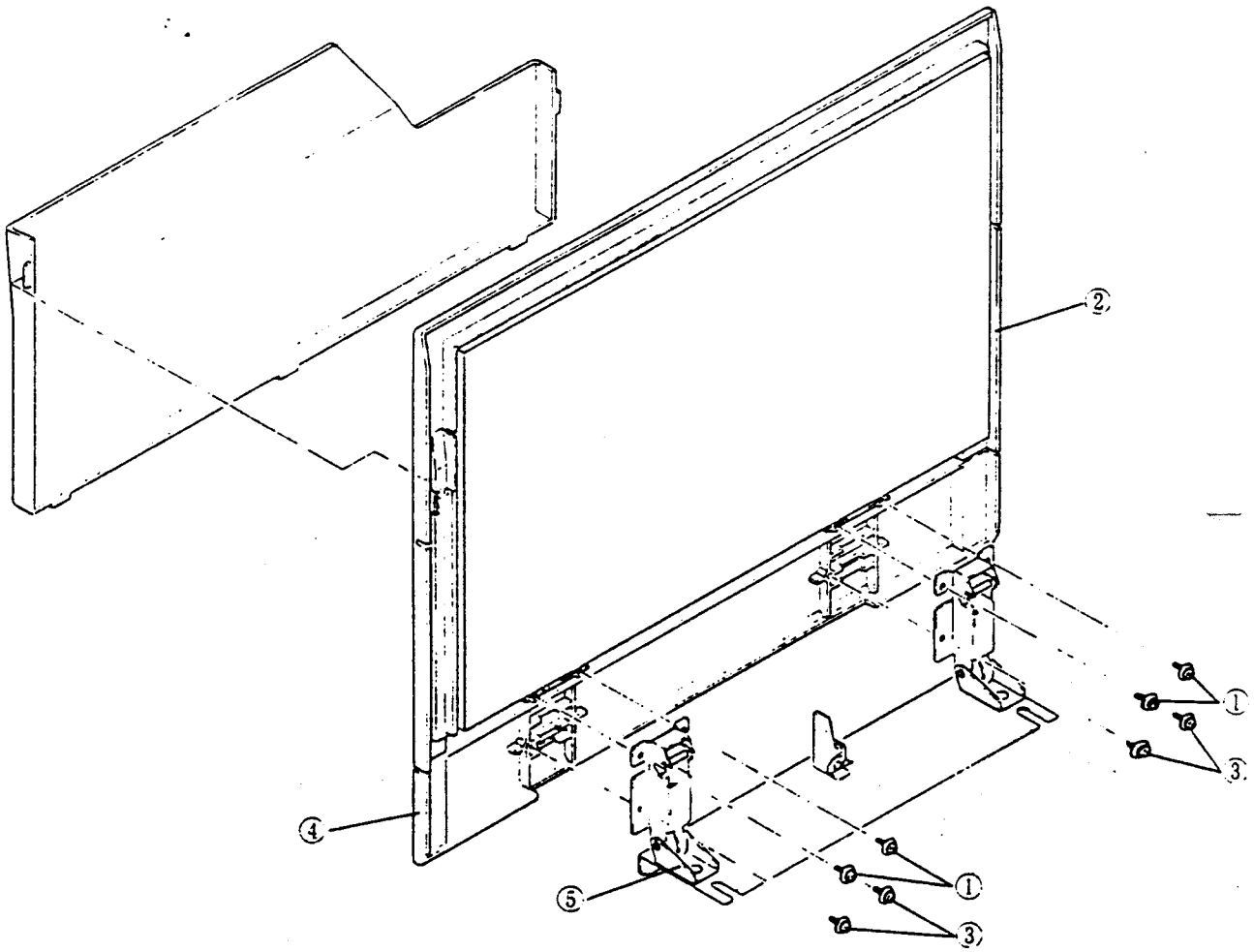


Fig.26

4-2-1 Removing the original holder.

* The original holder is held to the large original cover at five locations as shown in Fig.27. Observe the following steps to remove.

a. Bend the original holder up to release it from the latched portion A.

b. Release latches at B, C, D, and E in the arrow direction F.

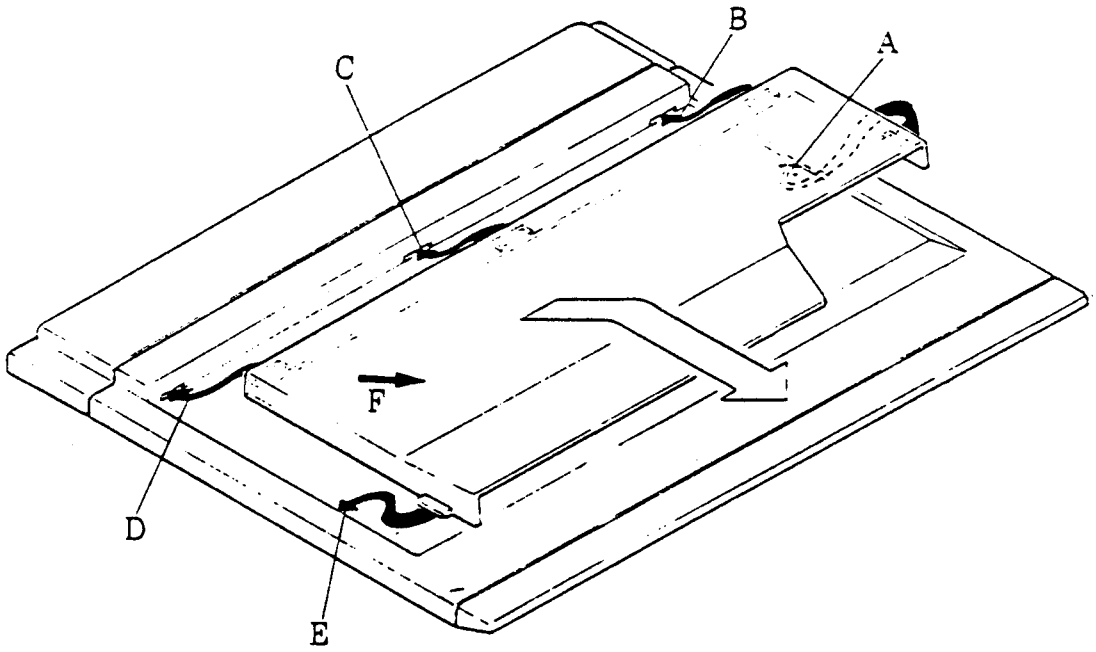


Fig.27

4-3. Table glass and table slider

a. Remove the original cover unit from the table glass assy in accordance with 4-2-a and 4-2-b.

b. Remove the four screws ① in Fig.28 and remove the wire holder ② with the wire.

c. Remove the two screws each, ③ ④ in Fig.28 and remove the table glass assy.

d. Remove the two screws ⑥ in Fig.28 and remove the left side glass support plate ⑦.

NOTE:

The preceding steps a thru c are not required when the left side glass support plate ⑦ in Fig.28 is to be replaced. Simply slide the table glass assy towards the left and replace.

e. Remove the four screws ⑧ in Fig.28 and remove the table slider ⑨.

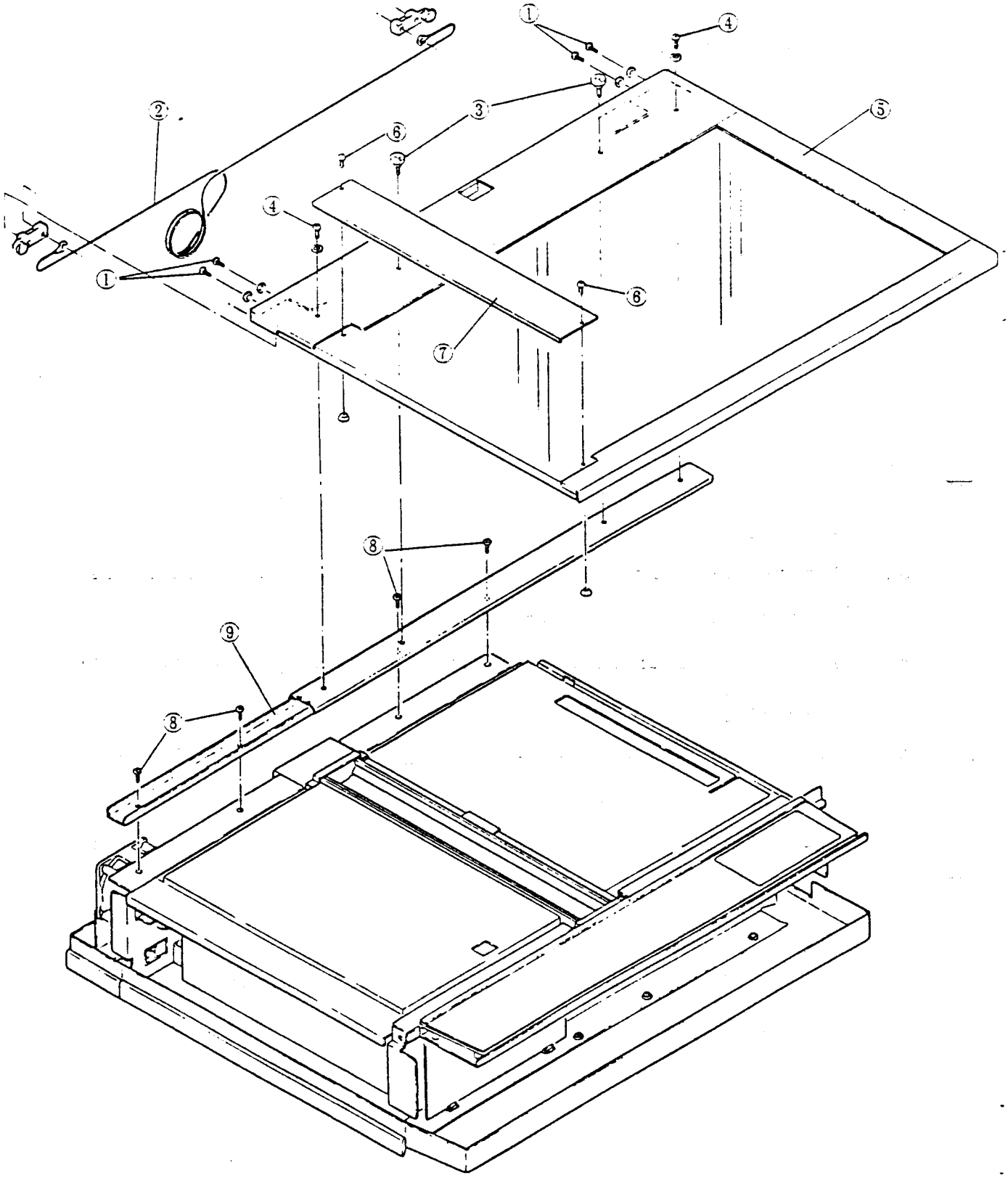


Fig.28

[Reassembly precautions]

° When the table glass assy is to be installed on the table slider, set the front side of the table glass assy and the front glass support plate as illustrated in Fig.29.

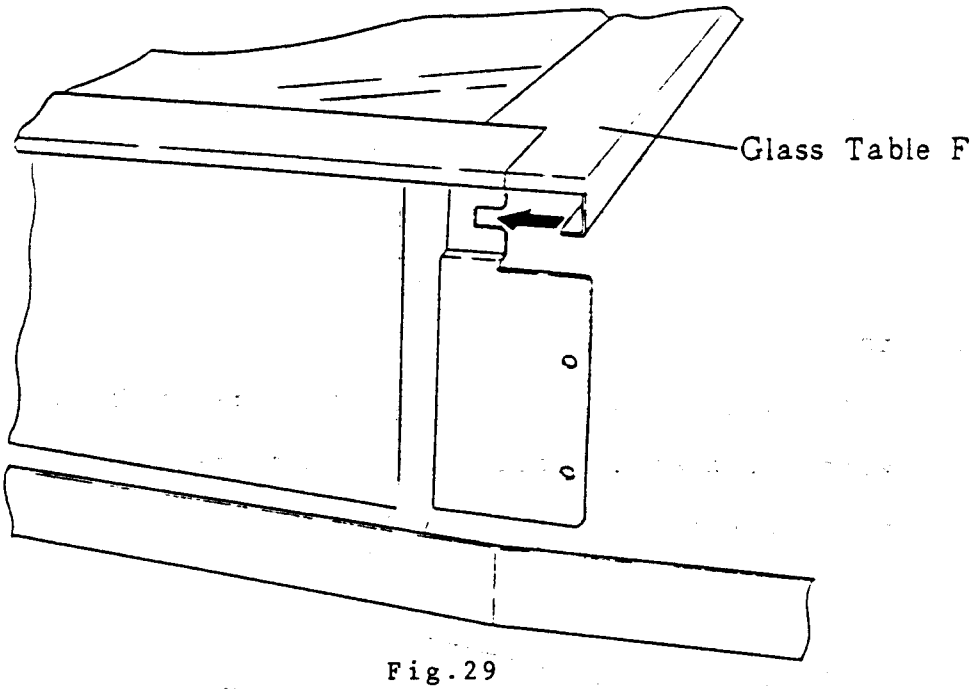


Fig.29

4-3-1 How to install the table drive wire

a. Check the location of the wire holder, pulley, and wire, in reference to Fig.30

b. Secure the drive wire ② to the wire holders ① in Fig.30 using the screws ③.

c. Secure the left side wire holder with wire ④ in Fig.30. to the table glass assy ⑤ using two screws ⑥.

Always install the drive wire starting from the left side wire holder.

Note: If the wire is loose, it may disengage from the wire holder and pulley.

d. Hook the drive wire in the rear side groove of the pulley A (7). Then, wrap the drive wire two and a half turns around the pulley (8).

e. Hook the drive wire in the front side groove of the pulley A (7). Then, slide the table glass assy (5) all the way to the right.

f. Secure the right side wire holder with wire (9) on the table glass assy (5) using two screws (10). (Fig.30)

g. Lower the pulley C (11) in Fig. 30 in the arrow direction and hook the drive wire (2) in the front side groove of the pulley C (11).

After installation of the drive wire, make sure that the wire has been installed as illustrated in Fig.30 and that the table glass moves smoothly.

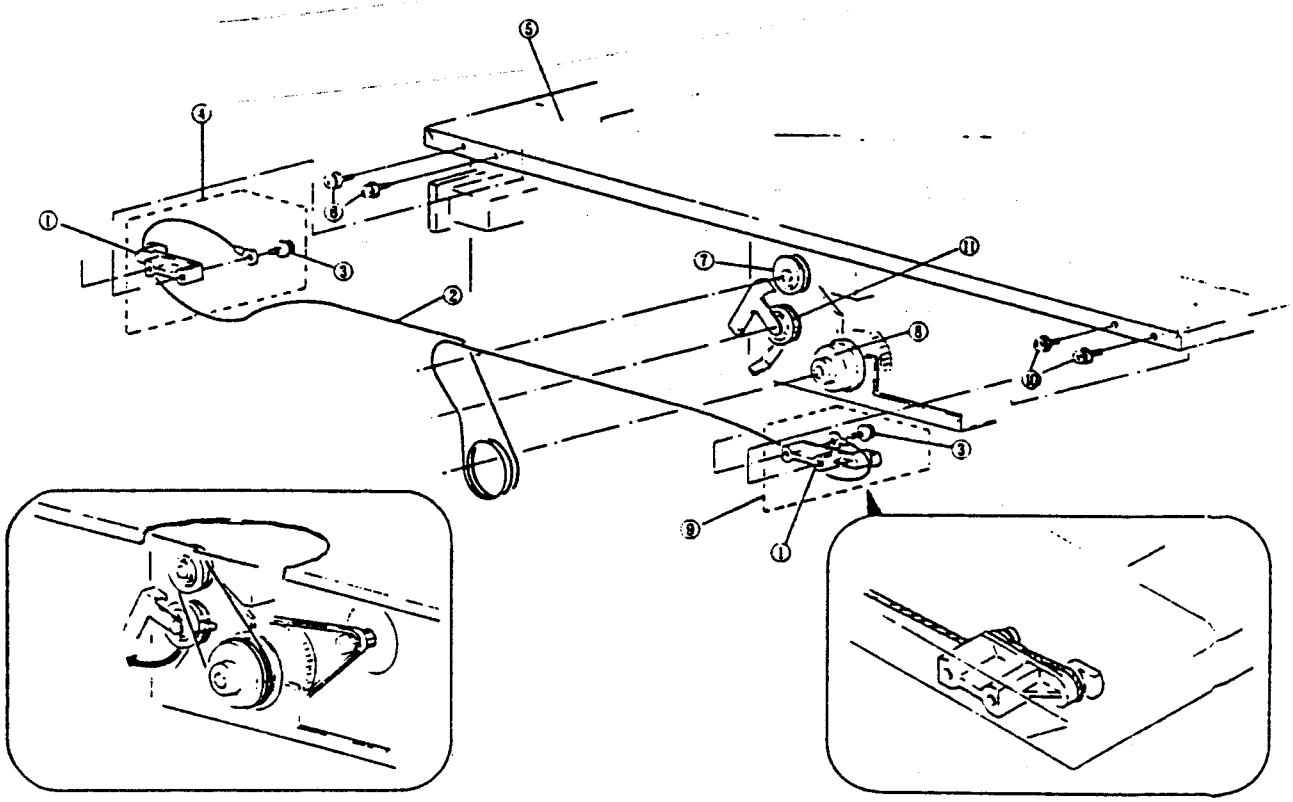


Fig.30

4-4. Operation panel

a. Remove the front cabinet from the copier according to the step 4-1-a.

b. Remove the operation panel cable ① in Fig.31.

c. Remove four screws ② in Fig.31 and remove the operation panel unit ③.

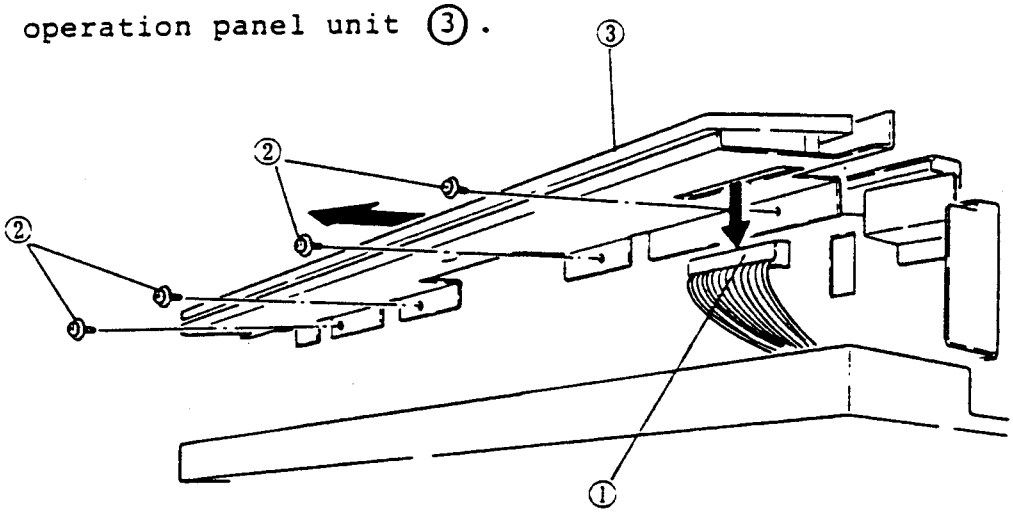


Fig.31

d. Remove the nine screws ① in Fig.32 and remove the operation panel mounting plate ②.

e. Remove the eleven screws ③ in Fig.32 and remove the operation PWB ④.

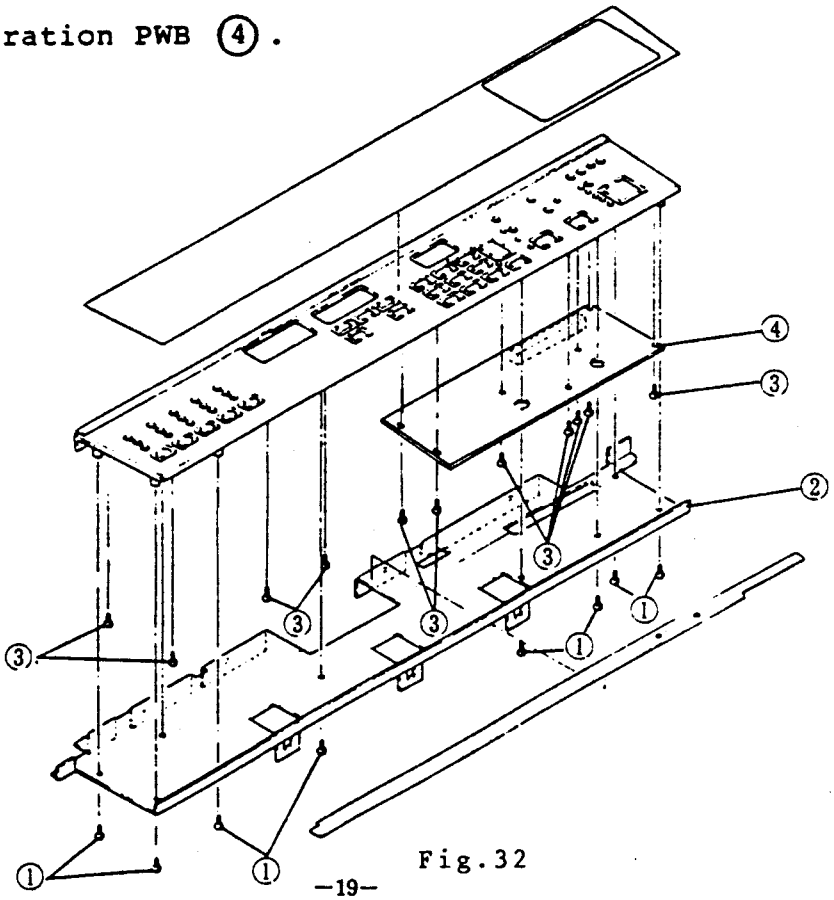


Fig.32

NOTE:

Item 4-5 discusses the scanner mechanism.

The description assumes that the cabinets, original cover unit, table glass, slider, and operation panel unit have been removed. For disassembly of cabinets, original cover, etc., refer to Items 4-1 thru 4-4.

4-5. Light source unit

a. Remove the four screws (1) in Fig.33 and remove the filter holder assy (2).

b. Unfasten the lamp sensor PWB connector (3), two lamp assy connectors, and the heater connector (5) from the fluorescent lamp actuating PWB (6).

c. Remove the one screw (7) in Fig.33 and remove the lamp assy (8) from the lamp box (9). (Slide it forwards you)

d. Remove the one screw (10) in Fig.33 and remove the lamp sensor PWB (11).

e. Remove the drive motor unit from the frame according to steps 4-7-a thru 4-7-c.

f. Remove the four screws (12) in Fig.33 and remove the lamp box (9).

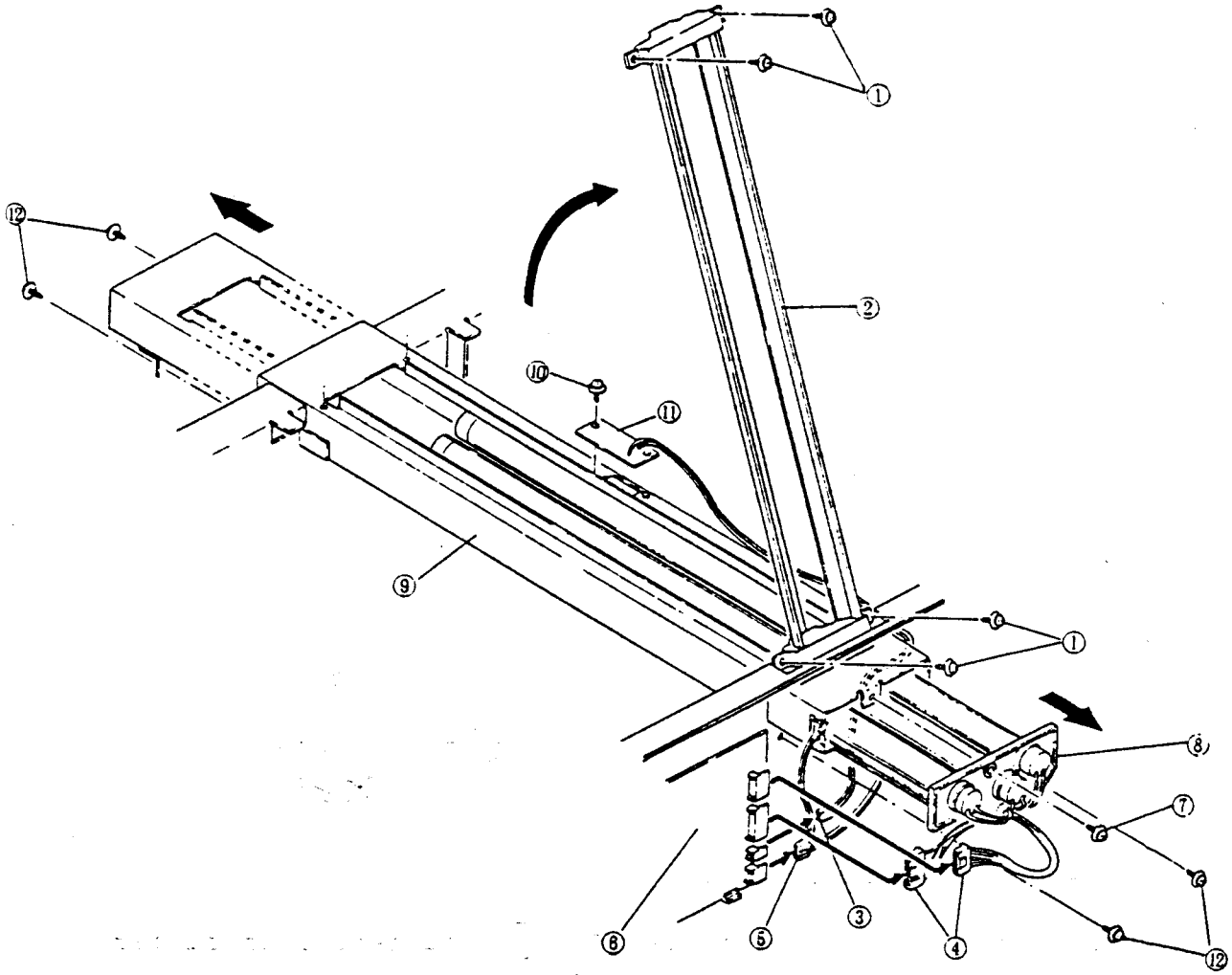


Fig.33

4-5-1 Assembly and reassembly of the filter holder assy.

As it is easy to disassemble, only the reassembly procedure will be discussed.

Filter holder assy (reflect mirror, filter, etc.) reassembly procedure

a. Install two reflect mirrors ③ in the filter holder F ① in Fig.34. The surface of the mirror must face inside. (See Fig.34 to defermine the mirror surface)

b. Install the blue filter ④ and the red filter ⑤ in the filter holder ①.

c. Install the two reflect mirrors ③, blue filter ④, and the red filter ⑤ in the filter holder R ② in Fig.34.

d. Install two filter holder clamps ⑥ in Fig. 34 in the filter holders F and R and secure them with four screws ⑦.

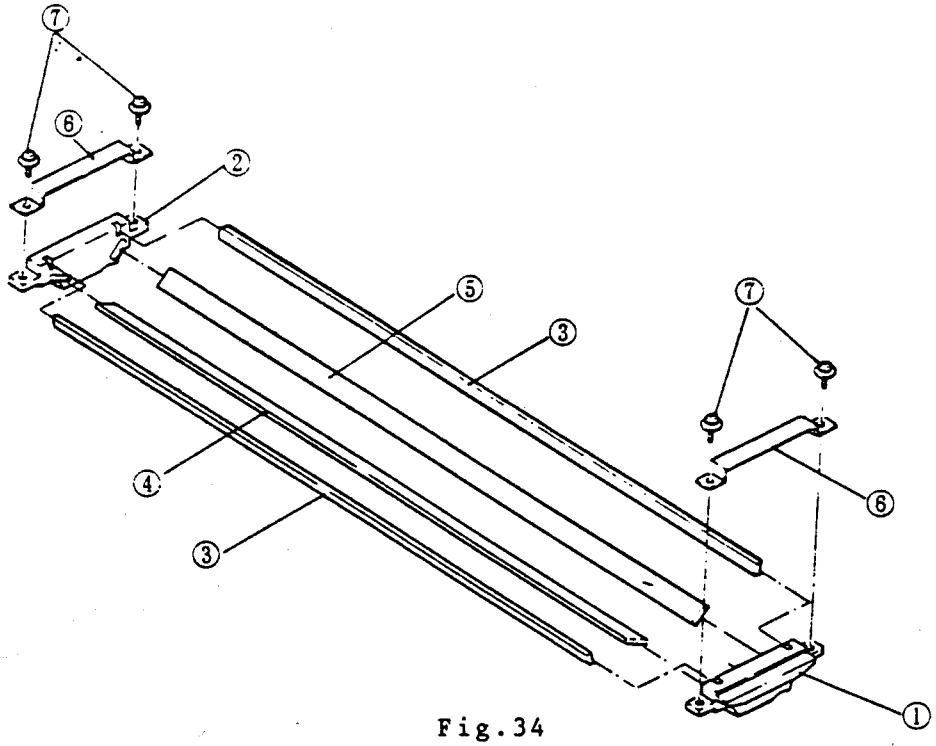
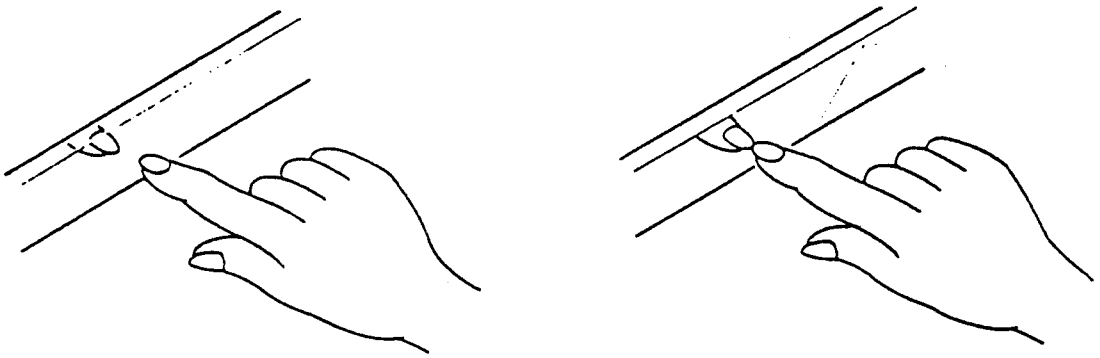


Fig.34

[Reassembly precautions]

- Note that the filter holder F ① differs from filter holder R. ② See Fig. 34 for their difference.
- To identify the surface of the reflect mirrors (Fig. 35), apply the tip of your fingernail (or pencil point) the mirror surface. The side on which your fingernail or pencil point reflects closer is the surface (Fig. 35A) and the side which reflects further is the back side (Fig. 35B).



B Fig.35 A

- After installation, check that the mirror filter is clean and not smeared. If so, it must be cleaned.

° See Item 4-3-1 for stretching of the drive wire.

4-6. Lens mount unit

* The cabinets and operation panel do not have to be removed for disassembly of the lens mount unit. Slide the table glass to right.

a. Remove the four screws (1) in Fig.36 and remove the left side cover (2).

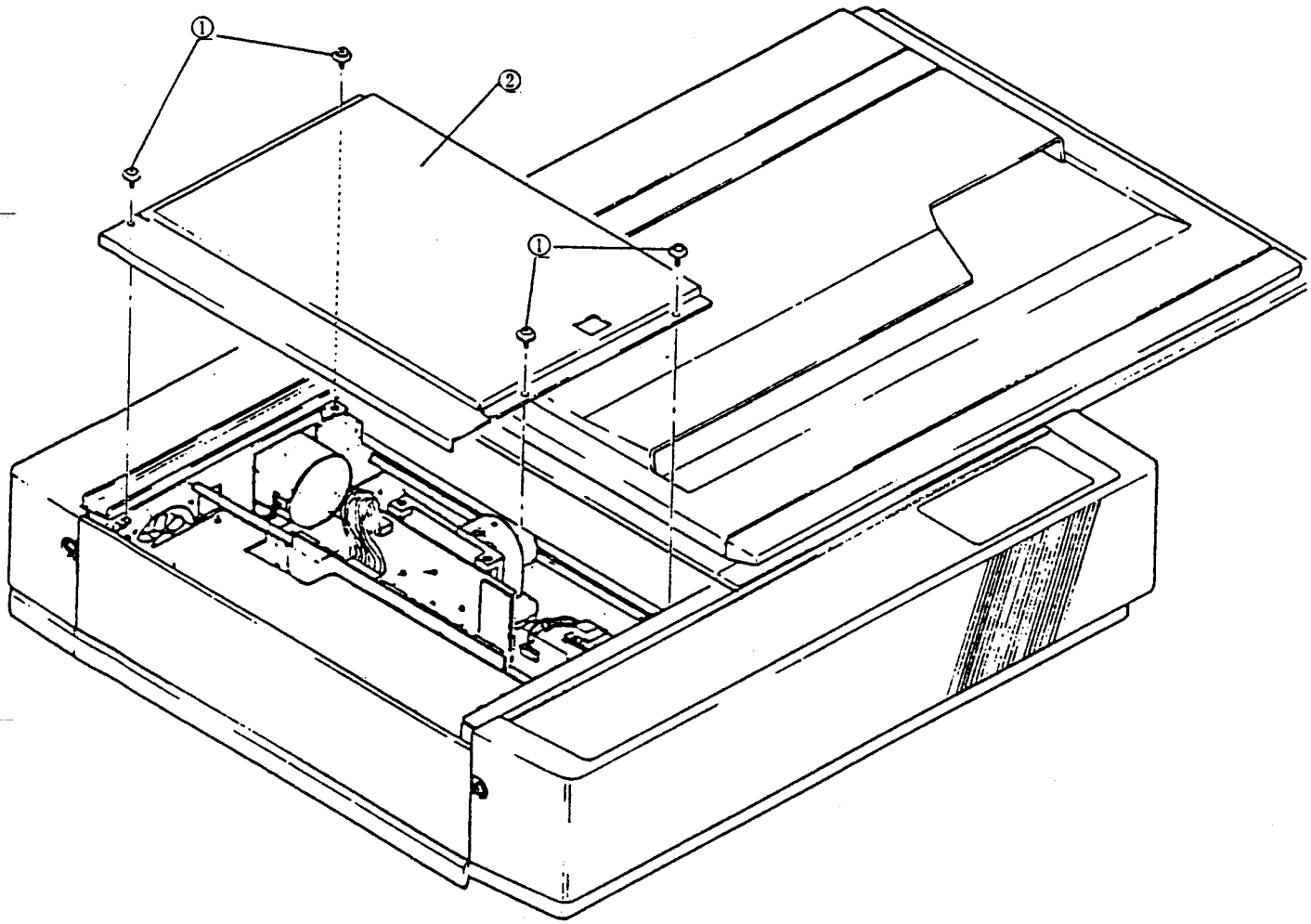


Fig.36

b. Remove the CCD cable (1) in Fig.37 from the CCD PWB (2).

c. Remove the two screws (3) in Fig.37 and remove the lens mount unit (4) from the optics holding plate.

d. Remove the two screws (5) in Fig.37 and remove the CCD PWB (2) from the lens mount unit (4). This step is not necessary if the CCD board is not going to be replaced.

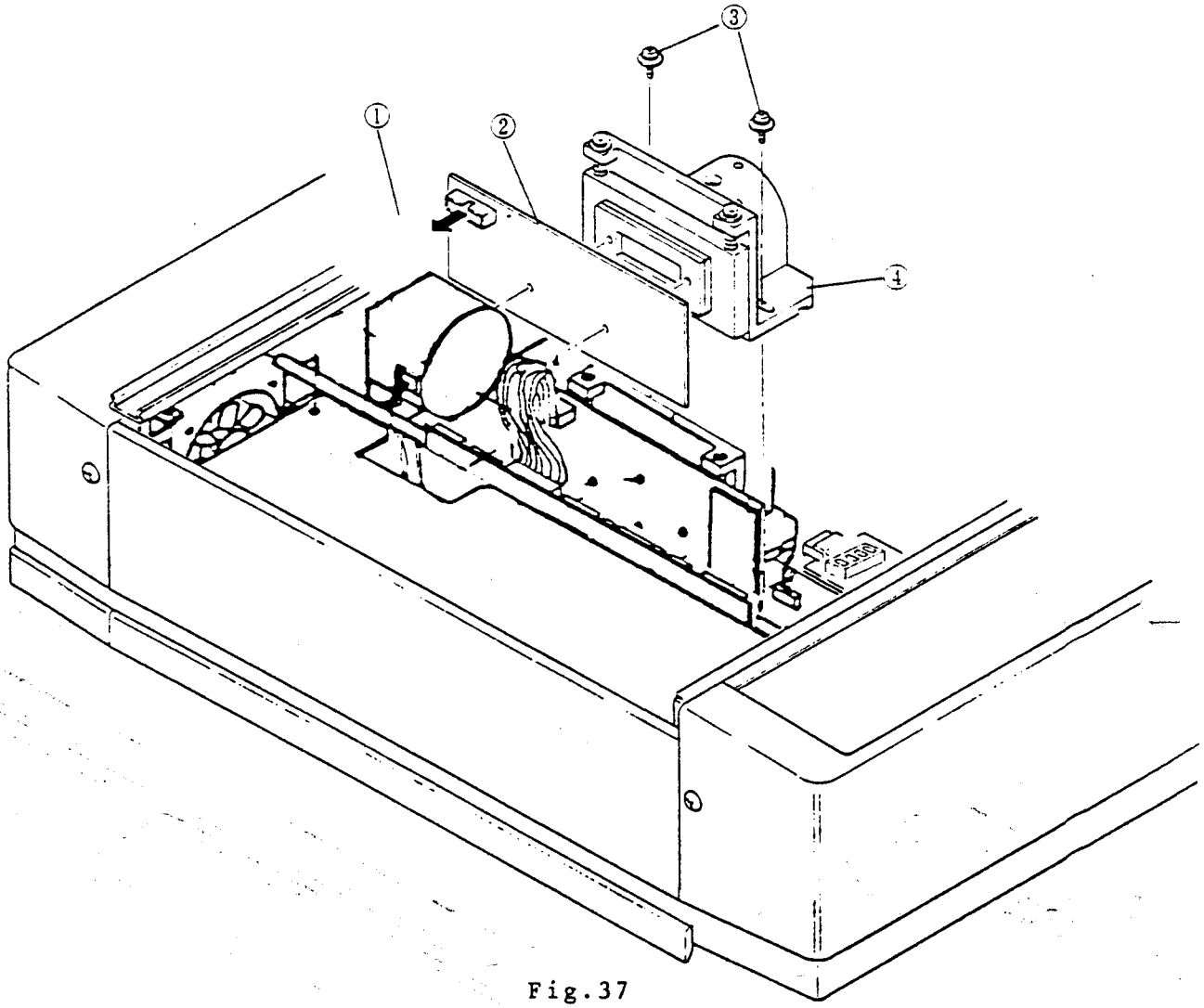


Fig.37

[Reassembly precautions]

- When the lens mount unit is to be installed on the optics holding plate, make sure that the positioning stud is in the hole of the lens mount unit.
- After installation of the lens mount unit, check that the lens surface is clean. If it is dirty or smeared it must be cleaned.

4-7. Drive unit

a. Remove the right side cover from the upper frame according to the procedure in 4-6-a.

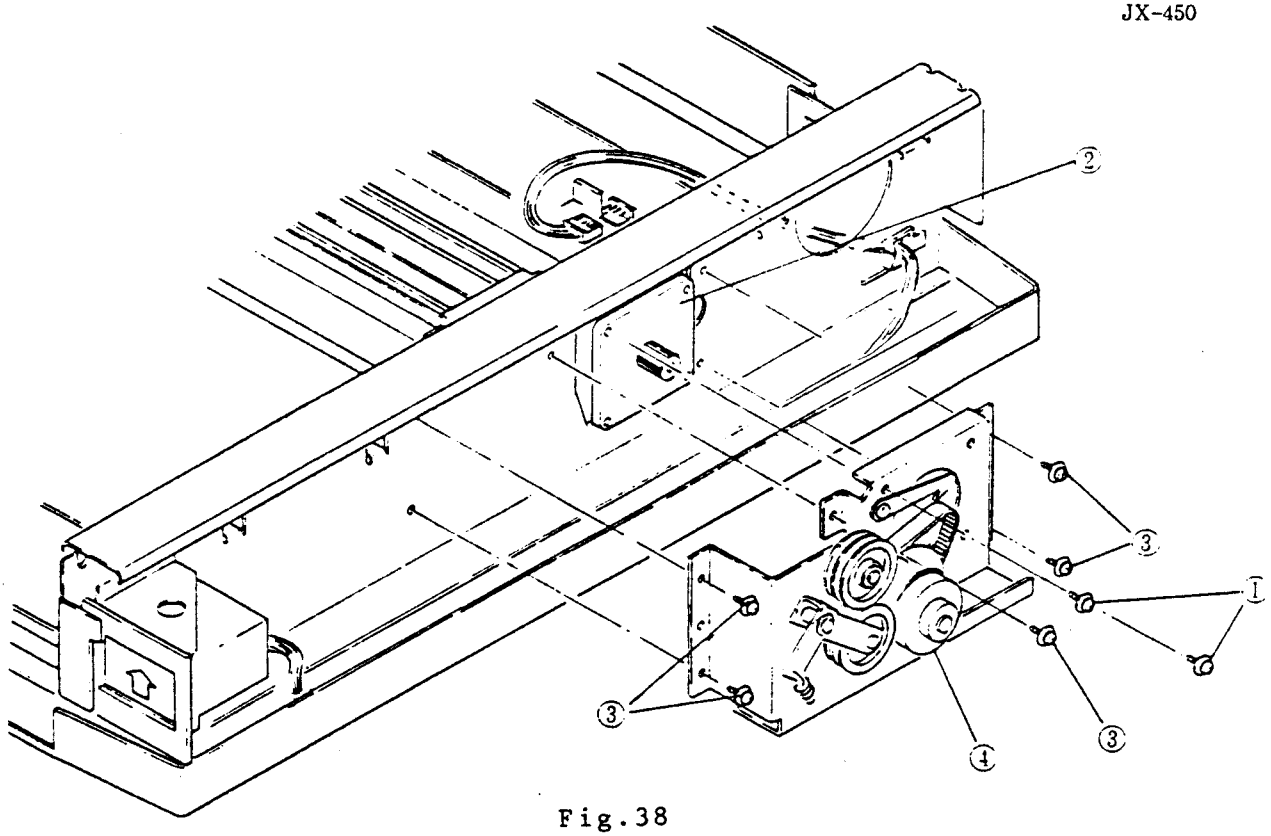


Fig.38

b. Remove two screws (1) in Fig.38 and remove the drive motor (2), from the inside frame.

c. Remove five screws (3) in Fig.38 and remove the drive drive unit (4). (except the drive motor)

d. Remove the one E-ring (1) in Fig.39 and remove the bearing (2).

e. Remove the pulley 76T assy (3) in Fig.39 and remove the drive frame ((18)).

f. Remove the belt (4) in Fig.39.

g. Remove the tension spring (5) in Fig.39.

h. Remove the one E-ring (6) in Fig.39 and remove the tension arm (7).

i. Remove the wire pulley (8) in Fig.39.

j. Remove the one E-ring (9) in Fig.39 and remove the wire pulley ((10)).

k. Remove the one shoulder screw ((11)) in Fig.39, then remove the flat washer ((12)), POLYSLIDER washer ((13)), and lock pawl ((14)).

l. Remove the release stay (15) from the lock pawl (14).

m. Remove the one screw (16) in Fig.39 and remove the collar (17) from the drive frame (18).

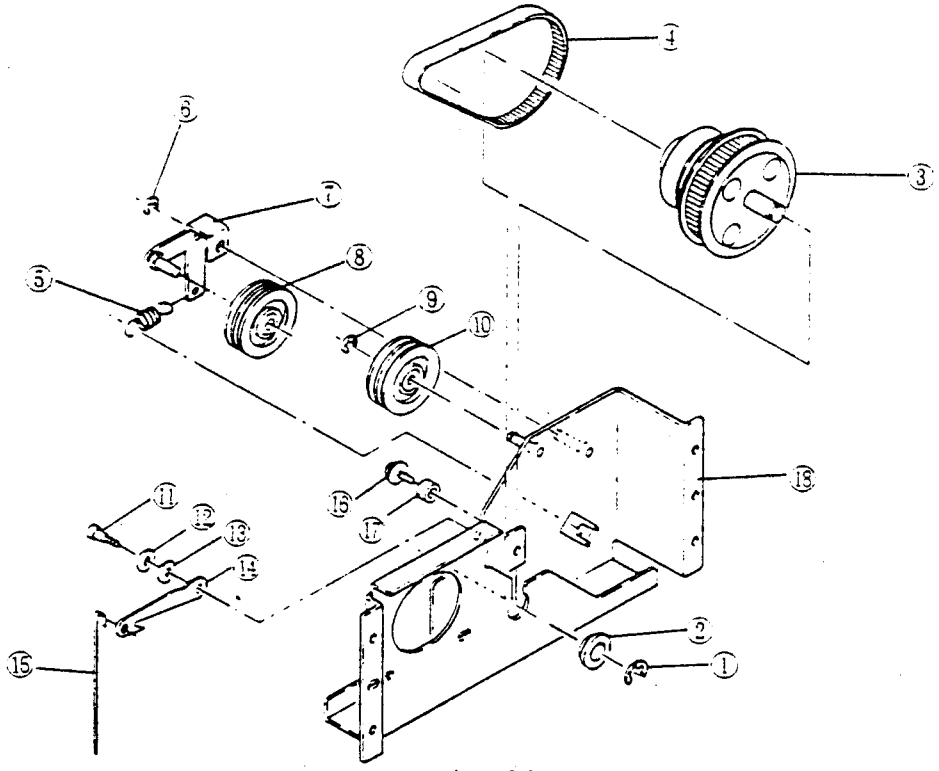


Fig.39

4-7-1 Pulley 76T (3) in Fig.39.

a. Remove the two setscrews (1) in Fig.40 and remove the drive pulley (2).

b. Remove the one E-ring (3) in Fig.40 and remove the bearing (4).

c. Remove the two setscrews (5) in Fig.40 and remove the pulley 76T (6) from the drive shaft (7).

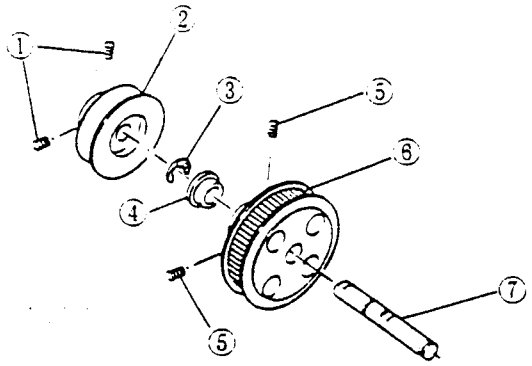


Fig.40

[Reassembly precautions]

° When the bearing and pulley is to be installed on the shaft, pay attention to the installation direction. Installation must be done in reference to the illustration.

° When the drive unit (except the drive motor) is to be secured on the frame with the screw, make sure that the positioning studs on both sides are properly engaged in the holes of the drive frame.

° When the drive motor is to be installed in the drive unit, keep the lock pawl above the motor gear and stretch the belt between the pulley 76T and the motor gear, then secure the drive motor on the drive unit with the screw.

° See Item 4-3-1, for stretching of the drive wire.

4-7-2. Replacing the drive motor

a. Remove the left side cover from the upper unit according to the procedure in 4-6-a.

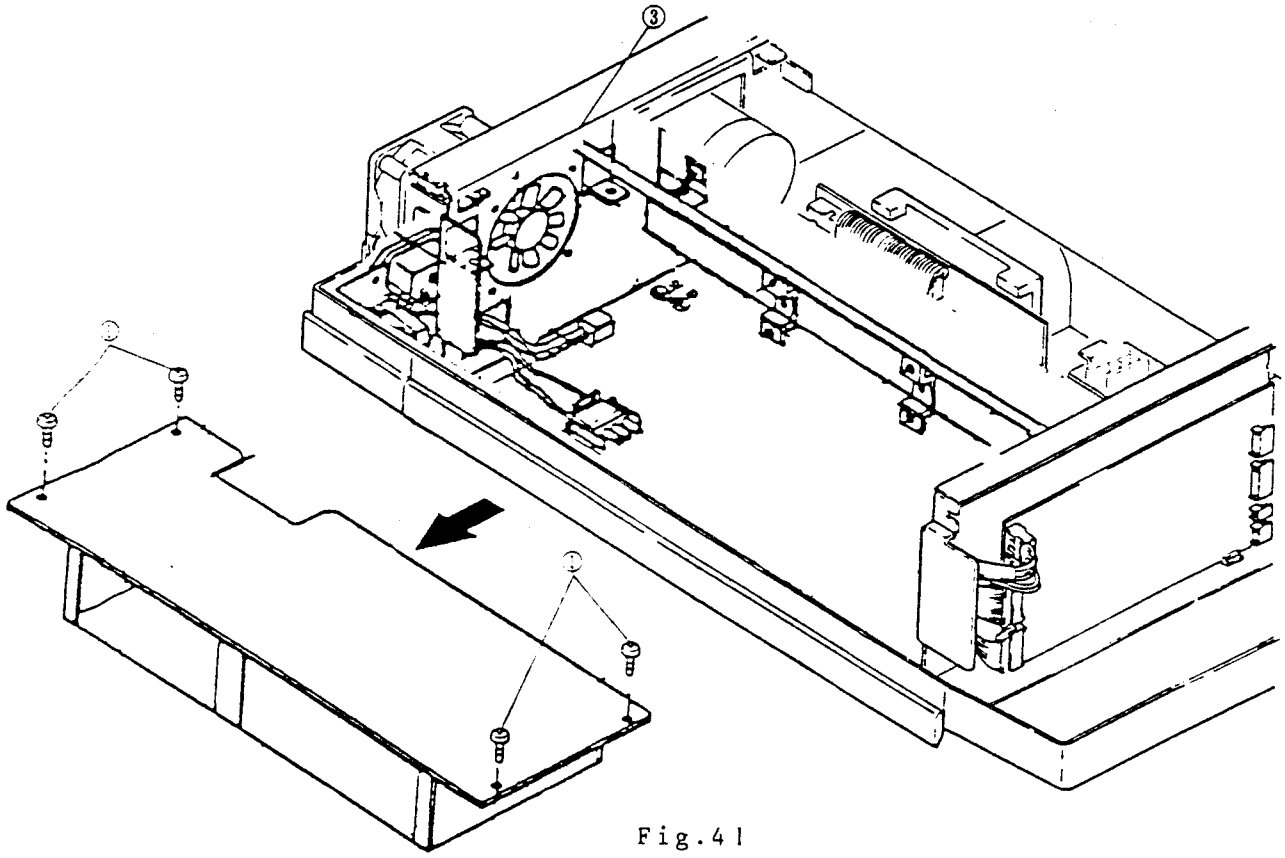


Fig.41

b. Remove the four screws ① in Fig.41, remove the Power supply unit.

c. Remove the two cables ① in Fig.42 and remove the control PWB ②.

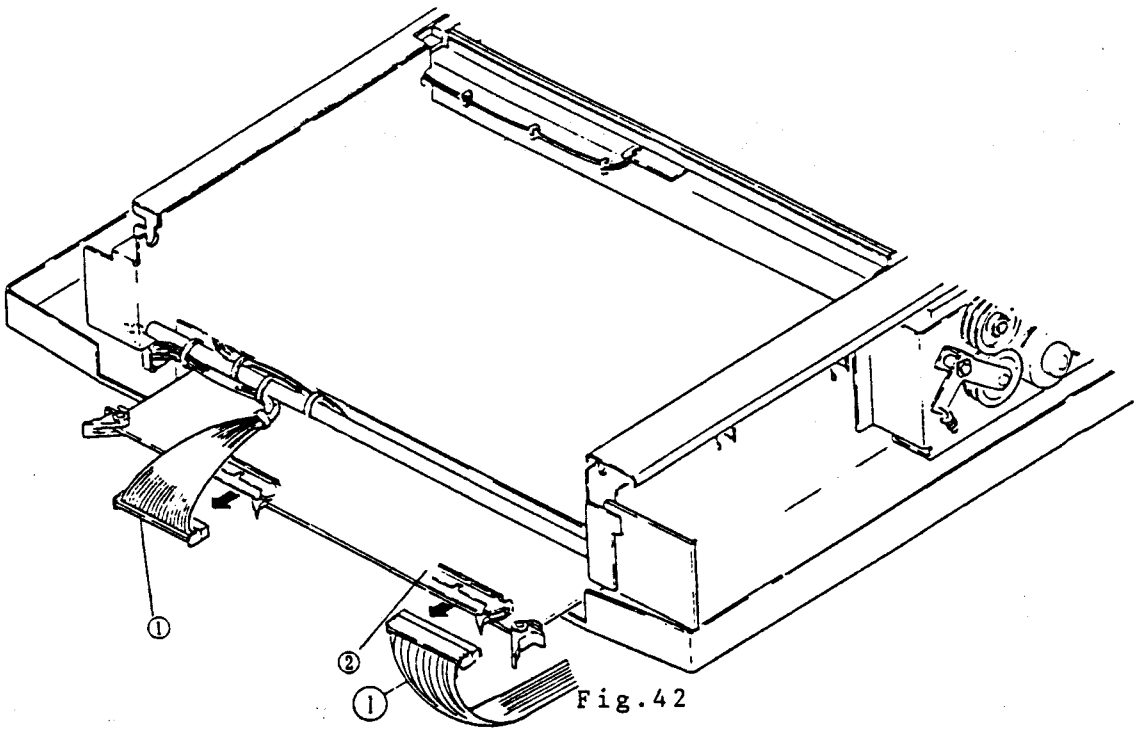


Fig.42

d. Unfasten the connectors on the nother PWB.

e. Remove the one screw ② in Fig.43 and remove the ground wire ③.

f. Remove the four screws ④ in Fig.43 and remove the mother PWB ⑤.

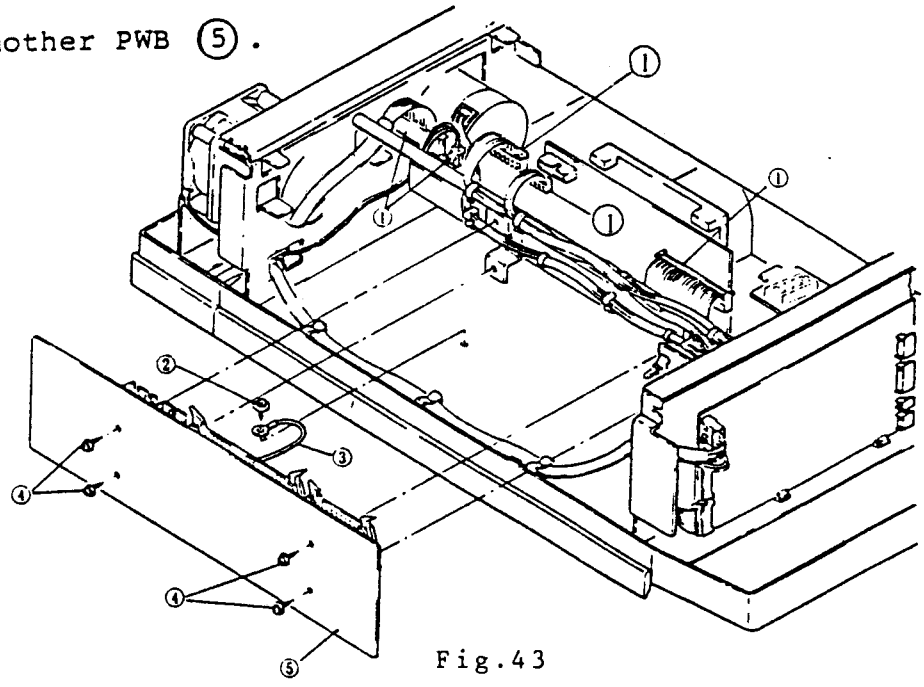


Fig.43

g. Unfasten the drive motor connector ② from the fluorescent lamp actuating PWB ① in Fig.44.

h. Take out the drive motor connector in Fig.44 towards the inside through the hole in the frame and remove the cable from the cable holder ③ in Fig.44.

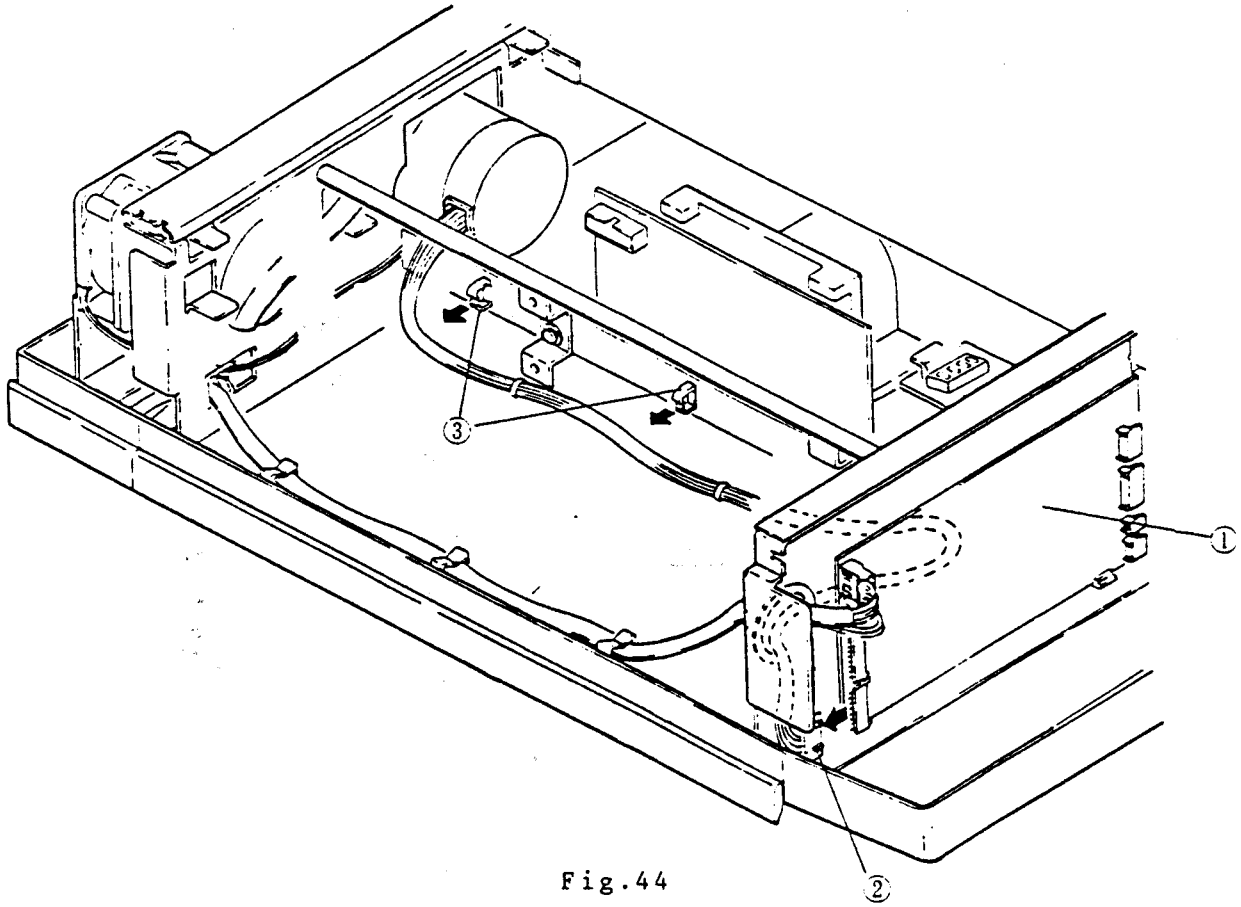


Fig.44

4-8. Fluorescent lamp actuating PWB

a. Unfasten the cable connectors except for the cables A and B ① in Fig.45.

b. Remove the two PWB holders ② in Fig.45 from the fluorescent lamp actuating PWB ③.

c. Remove the cables A and B ① in Fig.45.

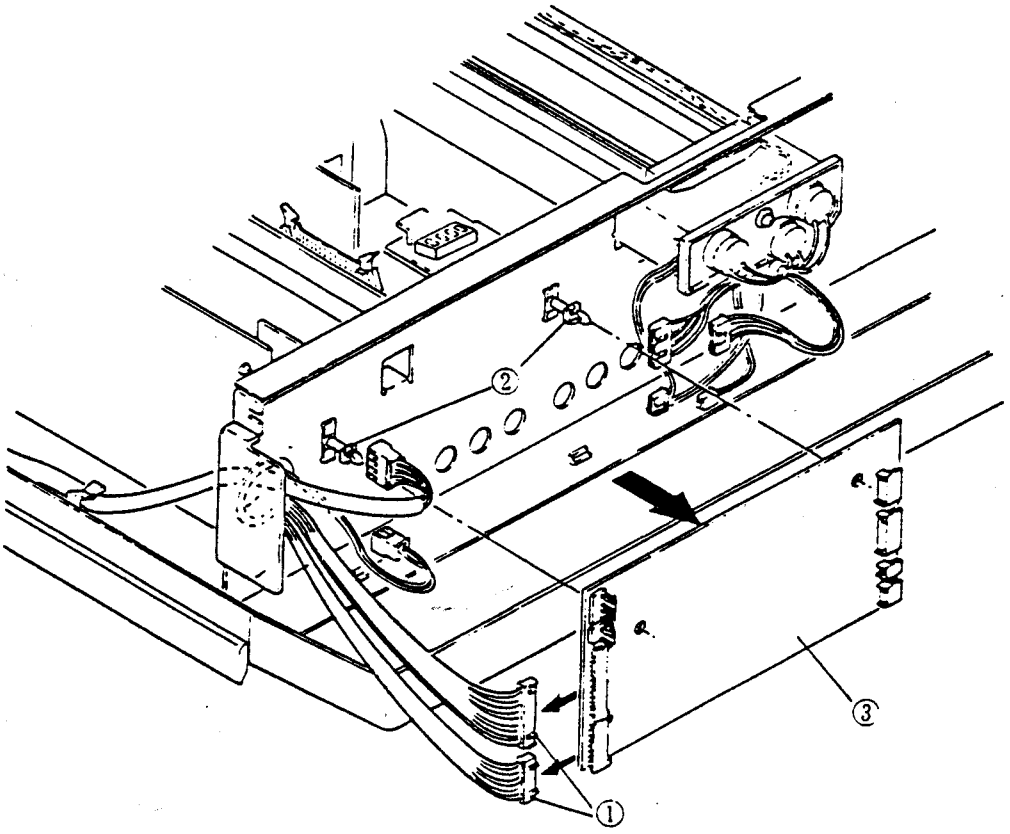


Fig.45

4-9. Rotating mirror unit

* There is no need to remove the cabinets, operation panel, and the table glass when disassembling the rotating mirror unit. Simply slide the table glass to the left to disassemble.

a. Remove the four screws ① Fig.46 that hold the right side cover on the frame, then remove the right side cover ② Fig.46 from the frame.

b. Remove the one screw ③ and remove the SNS PWB ④ .

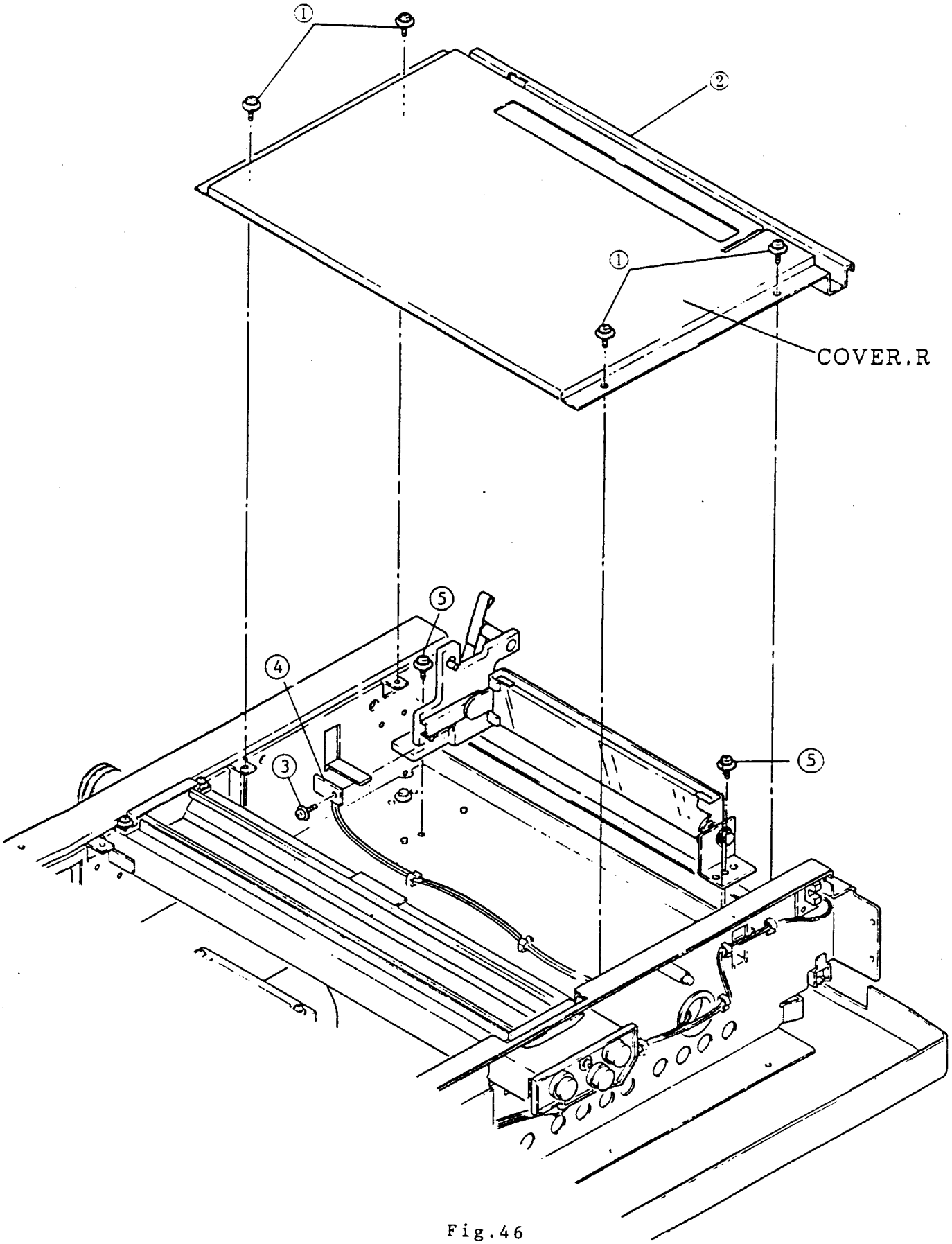


Fig.46

C. Remove the two screws (5) in Fig.46 and remove the rotating mirror unit.

e. Remove the one screw (1) in Fig.47 and remove the lever spring (2).

f. Remove the one E-ring (3) in Fig.47 and remove the mirror angle control lever (4).

g. Remove the mirror spring (5) in Fig.47.

h. Remove the one screw (6) in Fig.47 and remove the mirror control angle (7).

i. Remove the one E-ring (8) in Fig.47, then remove the bearing (9) and the mirror support table R assy ((10)).

j. Remove the one E-ring ((11)) in Fig.47, then remove the bearing ((12)) and the mirror support table F assy ((13)).

k. Remove the two mirror holding springs (14) in Fig.47 and remove the mirror-2 ((15)) from the rotating mirror holder ((16)). (See next page for mirror-2 removal.)

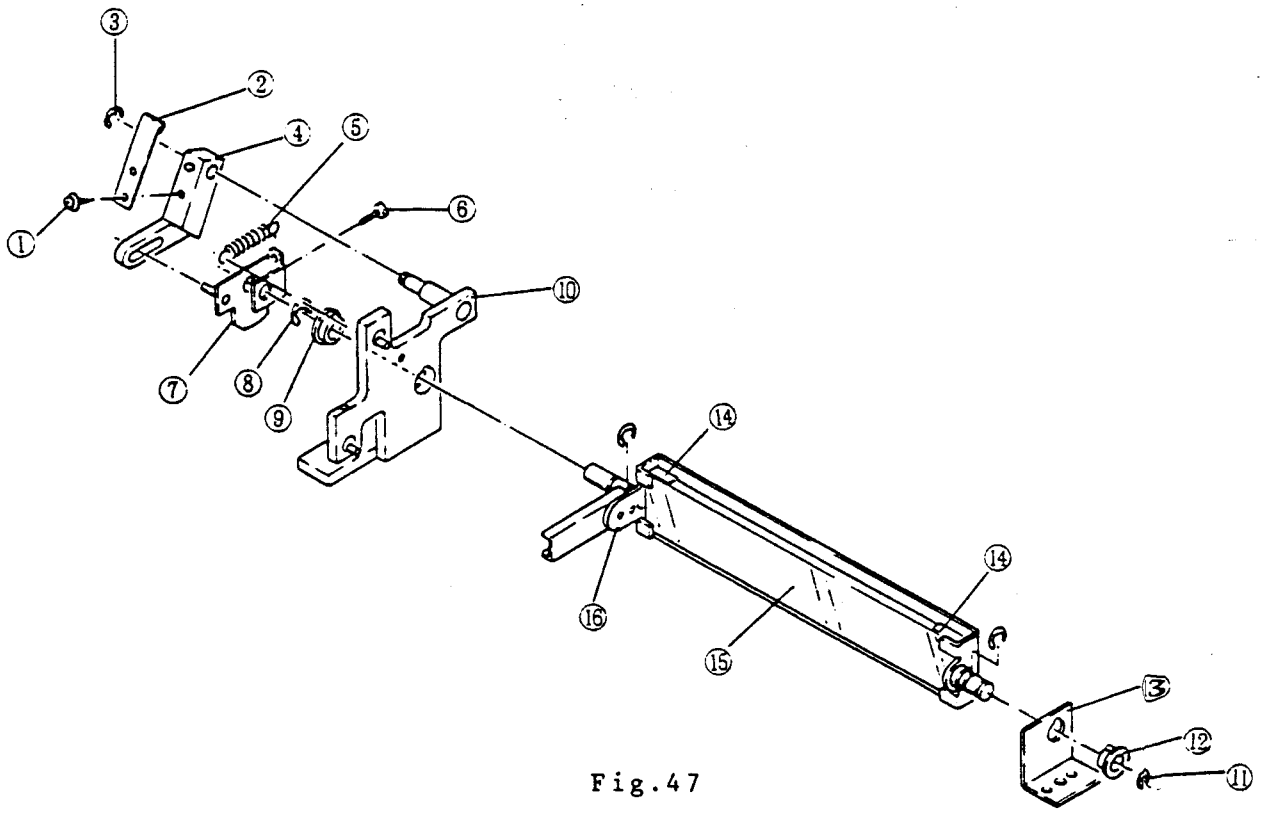


Fig.47

4-9-1 Removing the mirror-2 (Fig.48)

Insert a flat tip screwdriver between the rotating mirror holder and the mirror holding spring and press the screwdriver in the arrow direction in Fig. 25A to move mirror-2 upwards. Be careful not to damage the surface of the mirror-2 with the tabs in the rotating mirror holder (four).

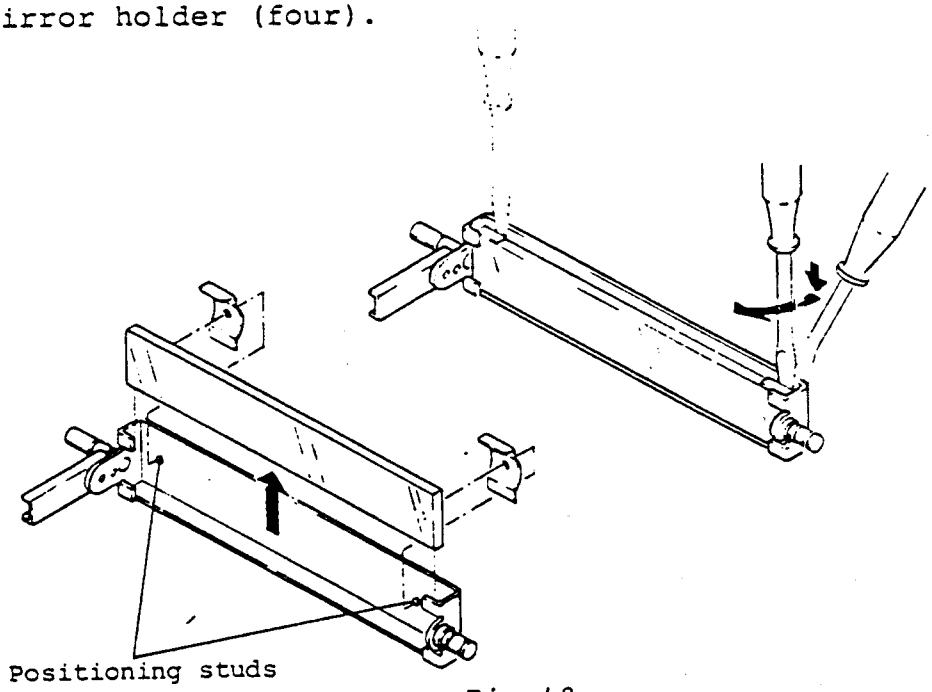


Fig.48

4-9-2. Replacing the mirror-2

a. Remove the right side cover according to 4-9-a.

b. Remove the FCM PWB according to 4-9-b and 4-9-c.

c. Remove the mirror-2 from the rotating mirror holder according to 4-9-k.

[Reassembly precautions]

- When the mirror-2 is to be installed on the rotating mirror holder, pay attention to the installation direction of the mirror surface. See Item 4-5-1 "Reassembly precautions" for the identification of the mirror surfaces. Mirror-2 must be installed with the surface to the outside (Fig.47).

° After installing the mirror-2 on the rotating mirror holder, insert two mirror holding springs between the mirror-2 and the rotating mirror holder and secure the mirror-2. Make sure (after inserting the mirror holding springs) that the positioning studs are properly engaged in the hole of the mirror holding springs.

4-9-3 Procedure to install the rotating mirror unit.

a. When the SNS PWB is to be secured on the mirror holding table R assy with the one screw, make sure that the positioning stud is properly engaged in the hole of the SNS PWB. See Fig.46 for the installation direction of the SNS PWB.

b. When installing the mirror support table R assy on the optics holding plate with one screw, make sure that the two positioning studs are properly engaged in the holes of the mirror support table R assay.

c. Insert bearing A in hole A of the mirror support table R assy; with the bearing A protrusion matched to the indention in hole A.

d. Observe the same procedure as above to insert the bearing B in the hole B of the mirror support plate F.

e. When the mirror support table F is to be secured on the optics holding plate with the one screw, make sure that the two positioning studs are properly engaged in the two holes of the mirror support table F.

f. Fasten the SNS PWB connector.

° After installing the rotating mirror unit on the optics holding plate, the mirror-2 must be wiped dry and clean.

° After the cable is installed in the wire holder, make sure that the cable does not separate from the wire holder.

4-10. SNS PWB unit

* Note that three SNS PWB's are used; A, B, and C. See Fig.49 for their location.

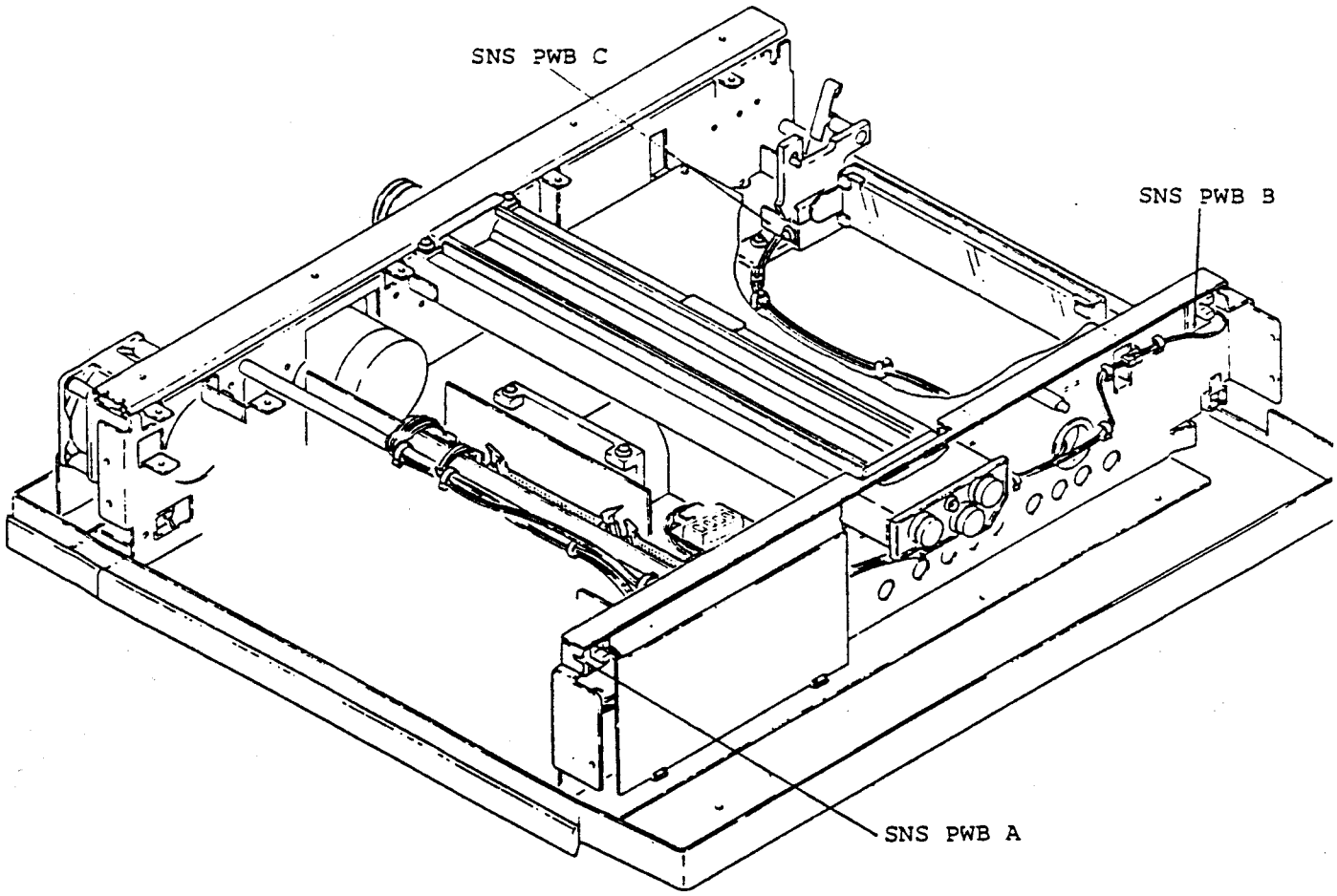


Fig.49

a. Remove the fluorescent lamp actuating PWB from the frame according to the procedure in 4-8-a thru 4-8-c.

b. Remove are screw (1) in Fig.50.. Then, remove the interfacing connector (2) and remove the SNS PWB A (3).

c. Remove the one screw (4) in Fig.50 and remove the cover angle (5).

d. Remove the one screw (6) in Fig.50. Then, remove the interfacing connector (7) from the SNS PWB B (8).

e. Remove the four screws that hold the right side cover and left side cover, then remove the covers from the frame.

f. Remove the FCM PWB from the frame according to the procedure in 4-9-b and 4-9-c.

g. Remove the SNS PWB C from the mirror support table R according to the procedure in 4-9-d.

h. Unfasten the interface connector (11) in Fig. 50 from the mother PWB (12). Then, remove the wire tie and clamp of the SNS PWB cable and take the cable out through the front frame side through the hole in the frame.

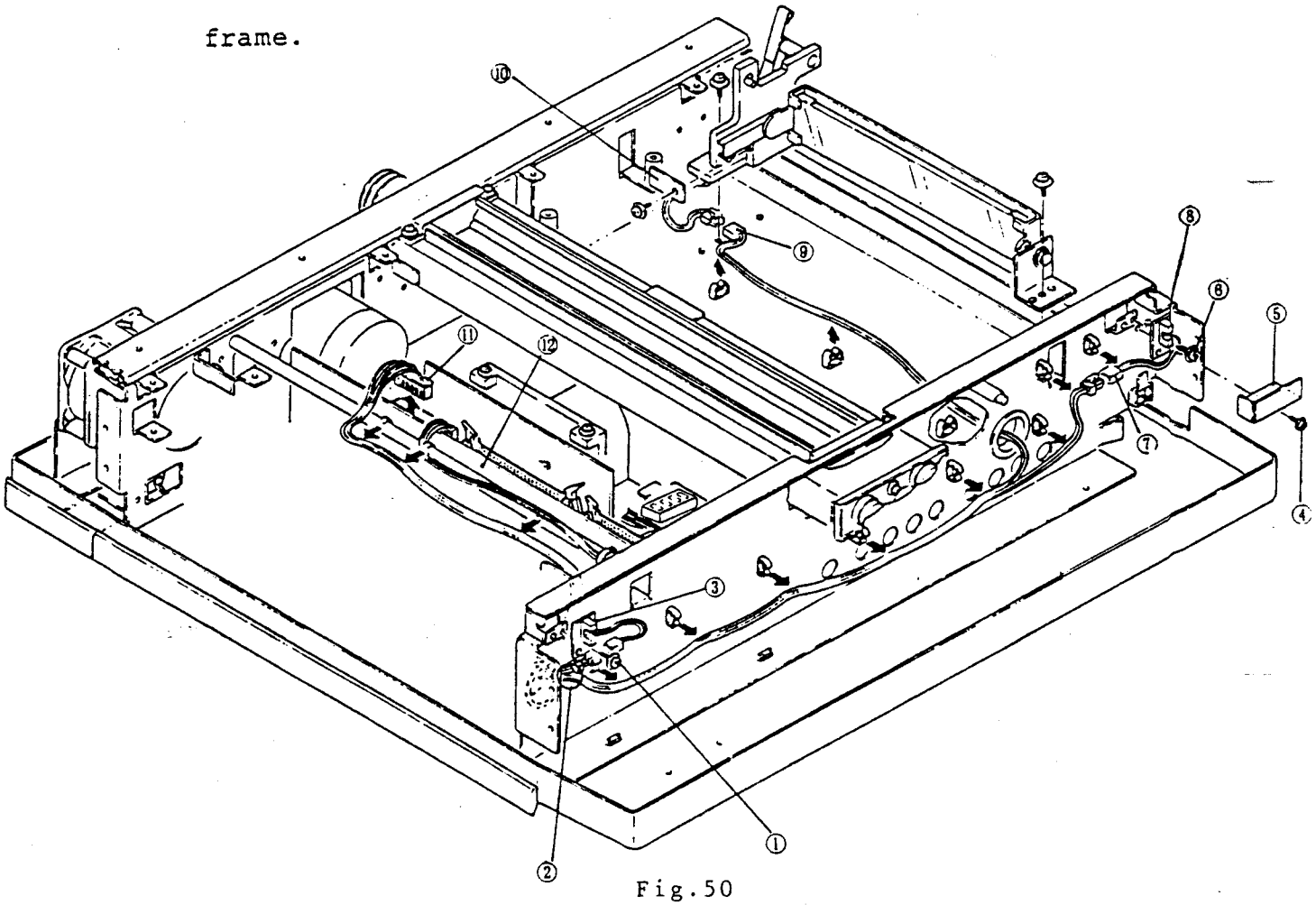


Fig.50

[Reassembly precautions]

- The SNS PWB, A, B, and C, differ in their cable length. The PWB with the shortest cable length is the SNS PWB A, the one with the intermediate length is the SNS PWB B, and the one with the longest length is the SNS PWB C.

° When securing the SNS PWB, A, B, or C on the mirror support table R assy, make sure that their positioning stud is properly engaged in the respective hole in the SNS PWB.

° When securing the wire from the SNS PWB A, B, or C on their wire holder, pay special attention to SNS PWB C cable so that it is flat and the wires are not separated. There is no need to remove the table glass to cabinets.

4-11. Mother PWB

* There is no need of removing the table glass to disassemble the mother PWB. Slide the table glass to right and remove the front, rear, and left side cabinets.

a. Unfasten the connector that interfaces the control PWB and remove the control PWB out of the guide.

b. Remove the table angle B from the frame.

c. Unfasten the connectors ① that interfaces the ADC PWB and remove the ADC PWB ② from its four holders ③. (Fig.51)

c. Unfasten the mother PWB ⑤ interfacing connectors ⑥ from the mother PWB ⑤ except for the connector A ④ in Fig.51.

d. Remove the one screw ⑧ that holds the ground wire ⑦ to the bottom plate and remove the ground wire ⑦ from the bottom plate in Fig.51.

e. Remove the four screws (⑩) that hold the mother PWB ⑤ on the mother PWB holding bracket ⑨, then remove the mother PWB ⑤ from the bracket ⑨ in Fig.51.

f. Unfasten the connector A ④ from the mother PWB ⑤ in Fig. 28.

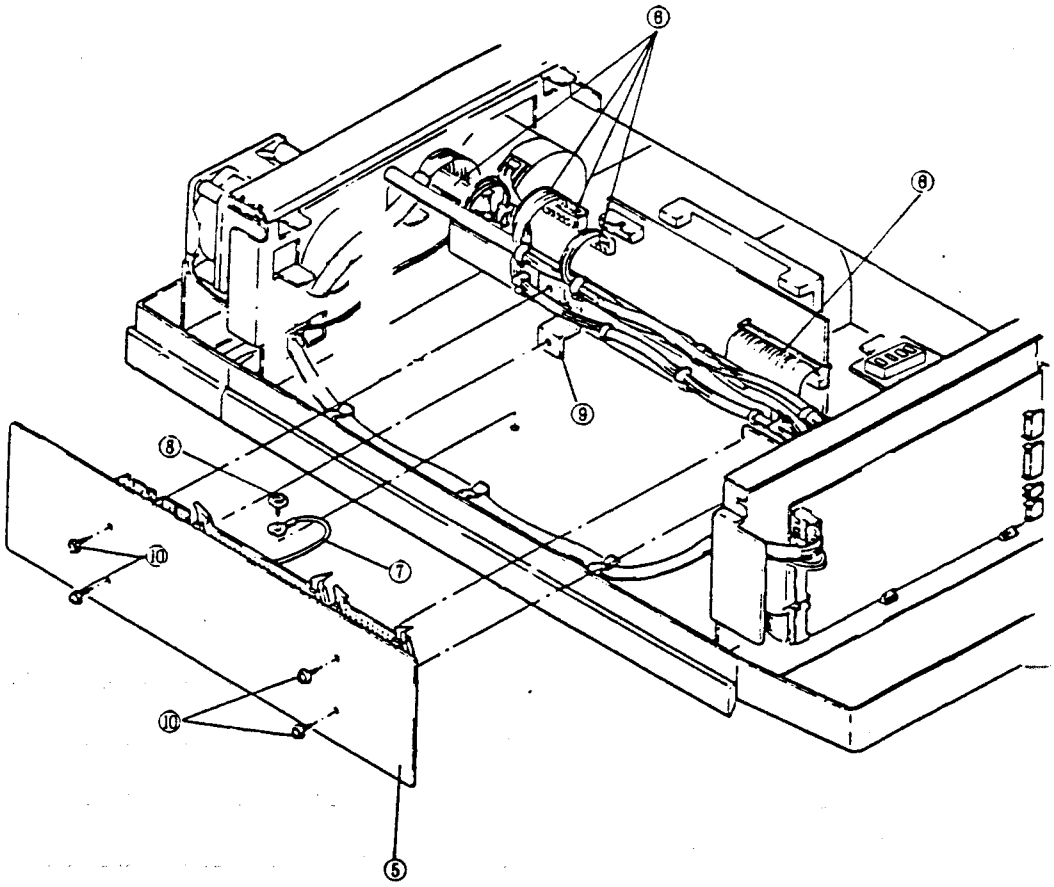


Fig.51

4-12. Mirror-1

a. Remove the drive motor unit from the frame according to the procedure in 4-7-a thru 4-7-c.

b. Remove the one screw (1) in Fig.52 and remove the mirror holder F (2).

c. Take out mirror-1 (3) in Fig.52 to the front, being careful not to damage the mirror with a frame edge.

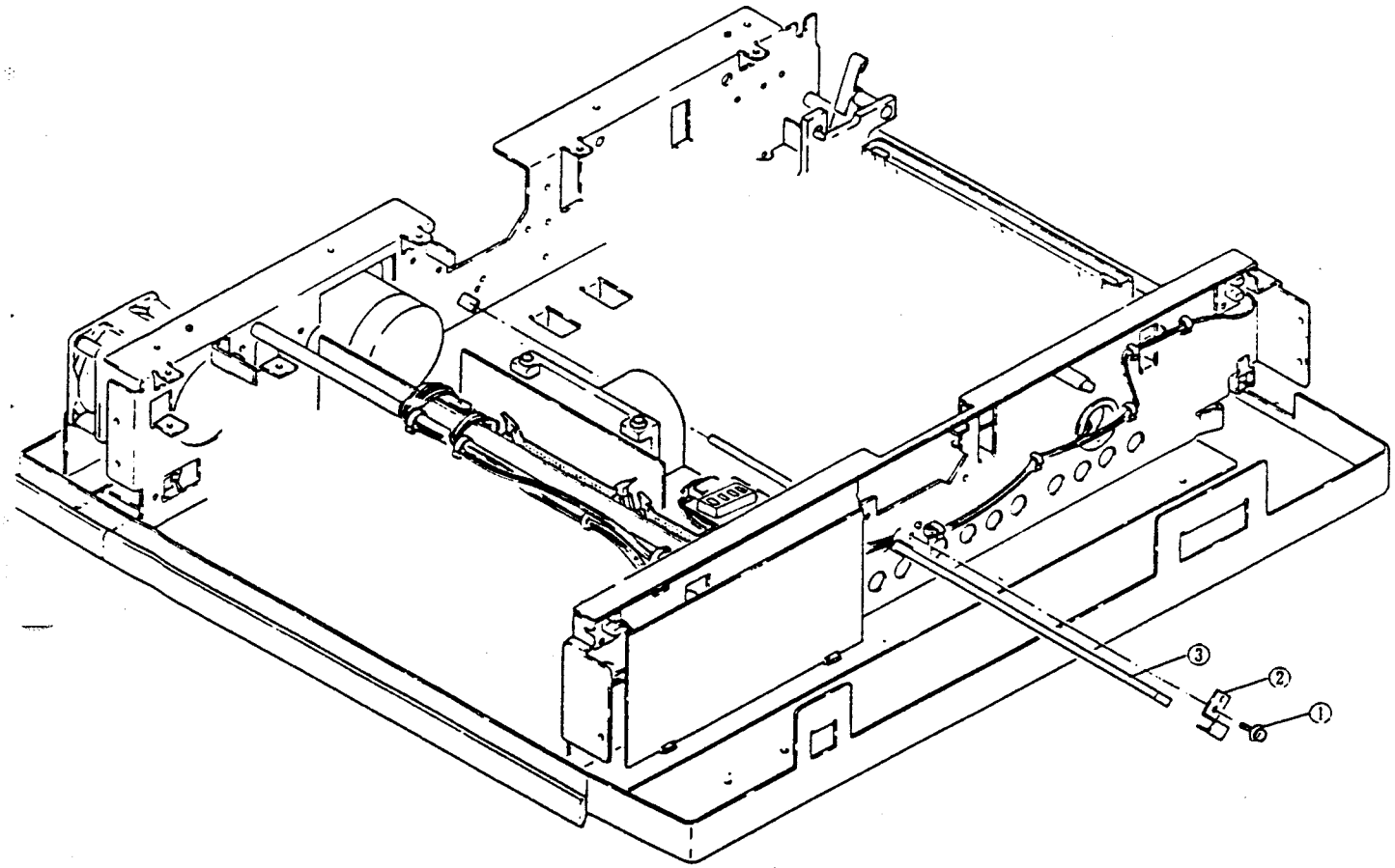


Fig.52

[Reassembly precautions]

° Pay attention to the front and reverse sides of mirror-1 when installing the mirror-1 on the mirror holders F and R. The surface of the mirror-1 must face up.

Refer to Item 4-5-1.

° Each positioning stud must be properly engaged in the hole of the mirror holders F and R, when installing the mirror holder F and R on the frame. (Fig.29)

4-13. Fan

a. Remove the left side cover from the upper frame.

b. Unfasten the connector that interfaces the ADC PWB, and remove the ADC PWB from the four board holders.

c. Remove the fan cable from the mother PWB.

d. Remove the two screws that secure the fan mounting bracket on the frame. Then, remove the two screws that hold the fan on the fan mounting bracket, and remove the fan from the bracket.

4-14. Control PWB

* Remove the front, rear, and right side cabinets.

a. Unfasten the connector interfacing the control PWB.

b. Remove the control PWB from the board guides.

III PRINCIPLES

5. Operating Principles

This section describes the fundamental principles of color and the operating principles of the color scanner/printer.

5-1. Seeing Color

Colors cannot be seen in the dark. Colors also cannot be seen when your eyes are closed. The color of an object cannot be seen if the object is not in view. Color is a visual phenomenon that is recognized by the existence of light, an object, and the eyes.

The process of recognizing color consists of light radiated from a light source striking an object and the reflected or transmitted light entering the eyes. The light stimulates the retina of the eyes causing the function of the optic nerves to be conveyed to the cerebrum resulting in the sensation of color.

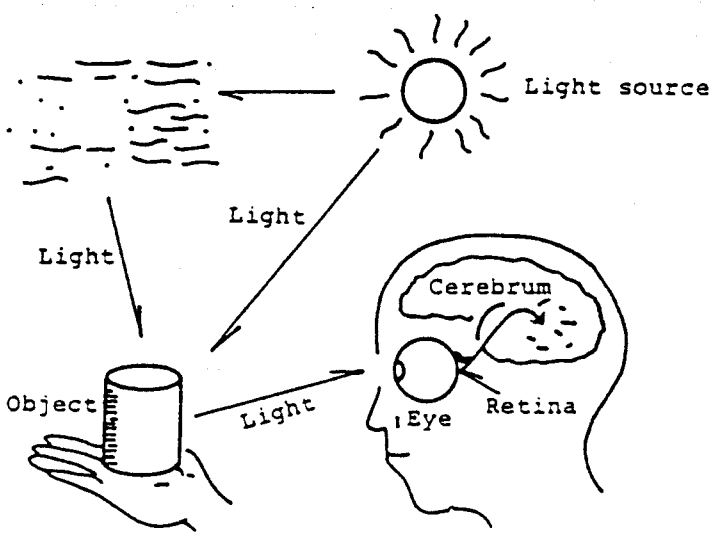


Fig.53 Process of Color Recognition

Color seen this way is called object color. When facing the eyes to a light source, the radiated light directly enters the eyes and is recognized as the color of the light source. The color seen in this manner is called light source color. Usually, the colors that we see are one of either type.

In daily life, you do not consciously see color as described

in the recognition process above. You look at and see the object. You then think an object that is colored exists. In this manner, seeing color as you sense it is called subjective viewing of color. In contrast, after taking into account the recognition process, seeing color having reproducibility based on standardized conditions is called objective viewing of color.

Although recognizing color itself is a phenomenon of subjective perception, it is important to understand objective viewing of color, or the rules of observing color for smooth communication with people regarding "color".

5-2. Light

Light is a type of radiation that stimulates the retina of the eye and causes a visual sensation. Radiation signifies the phenomenon of emission and propagation of energy based on electromagnetic waves and particles.

In the year 1666, Isaac Newton discovered that light is separated by a prism.

With a prism or diffraction grating, sunlight can be separated into distinctive lights with each having a definite wavelength (monochromatic light). This is called "dispersion." When white light is diffracted, the monochromatic lights form a continuous band ordered according to wavelength. This is called a "spectrum," the "seven colors of the rainbow (red, orange, yellow, green, blue, indigo, violet)."

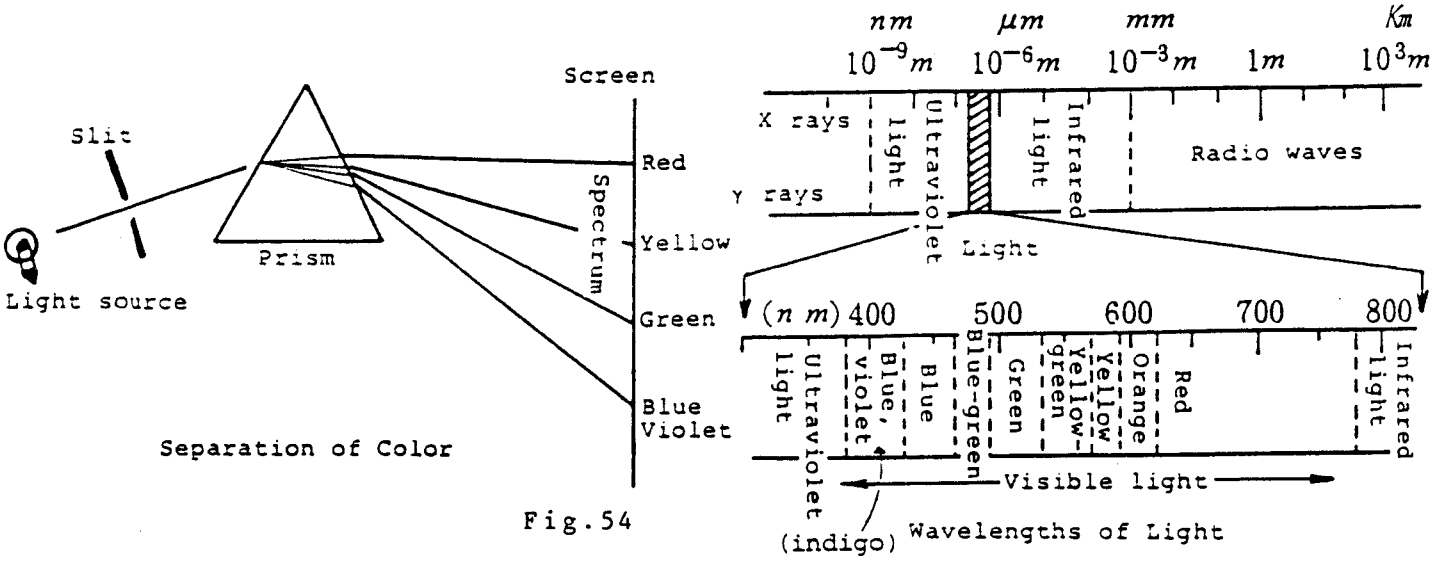


Fig.54

5-3. Fundamentals of Color

Human eyes can sense light with wavelengths from 380 nm to 780 nm (1nm = 10^{-9} m = 10^{-7} cm). Light in this range is called "visible light." Light with a wavelength shorter than this is called "ultraviolet light." Light with a wavelength longer than this is called "infrared light." Figure 55 shows the relationship between the wavelength of light and its color.

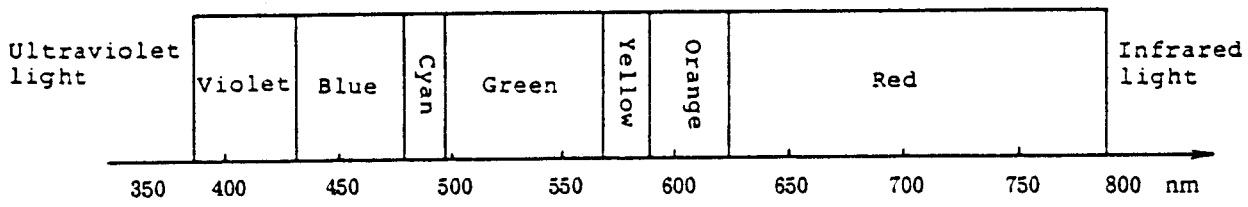


Fig.55 Wavelength and Color

Humans perceive brightness because visible light rays enter the human eye. Humans also perceive color because light having a wavelength in a certain region within the visible light spectrum that enters the eye provides a greater stimulus than the light having a wavelength in another region. Figure 56 shows the reflection characteristics of printed materials with different colors.

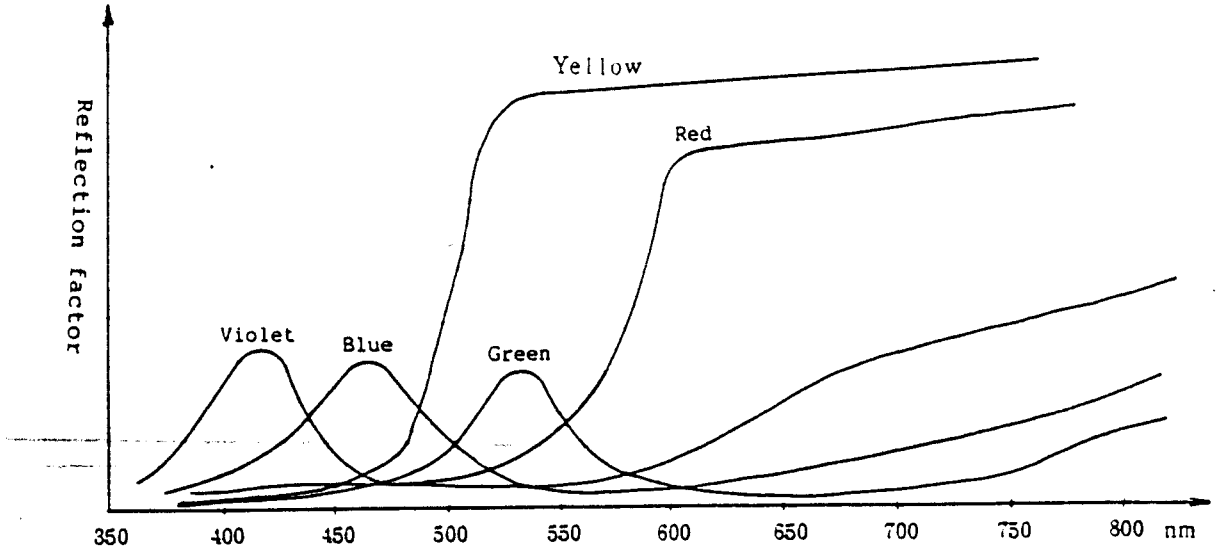


Fig.56 Reflection Characteristics of Various Colors

Humans perceive color in the following ways.

1) Light emitted from a hot object (flame, incandescent filament, sun, etc.) is perceived.

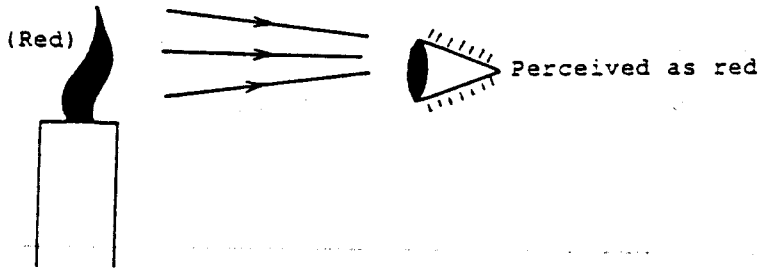


Fig.57

2) Light strikes an object (printed material, picture, etc.) that absorbs light of a certain region and the reflected light is perceived.

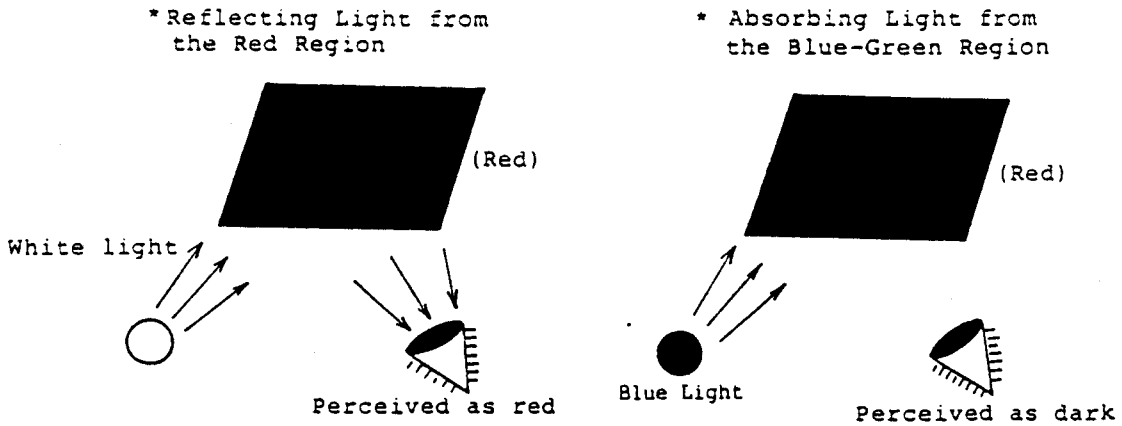


Fig.58

3) Light that passes thru a transparent object (film, glass, filter, etc.) which absorbs light of a certain region is perceived.

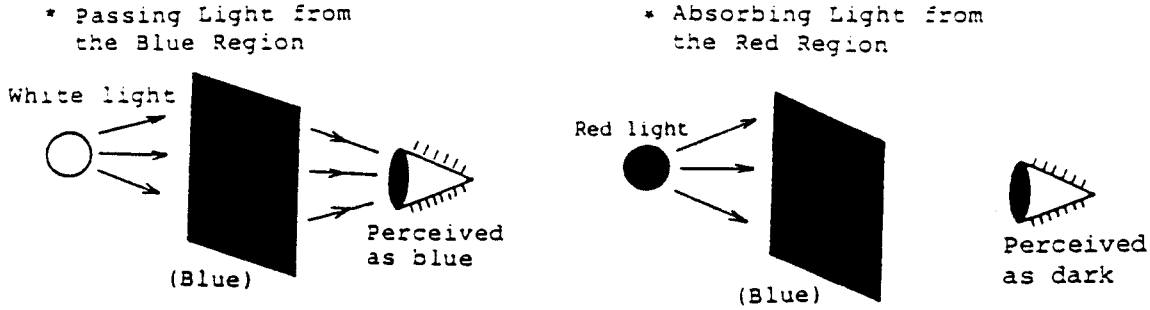


Fig.59

4) The short wavelength ultraviolet light strikes a phosphorescent material (fluorescent lamp, etc.) and is converted to visible light which is perceived.

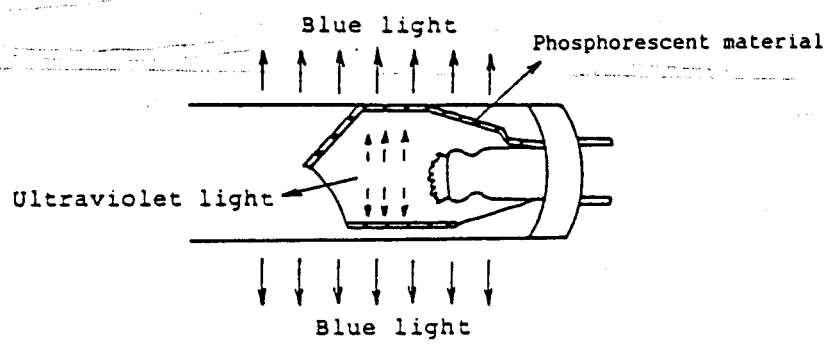


Fig.60

5) A phosphorescent material (TV, etc.) is excited by electrons and generates visible light which is perceived.

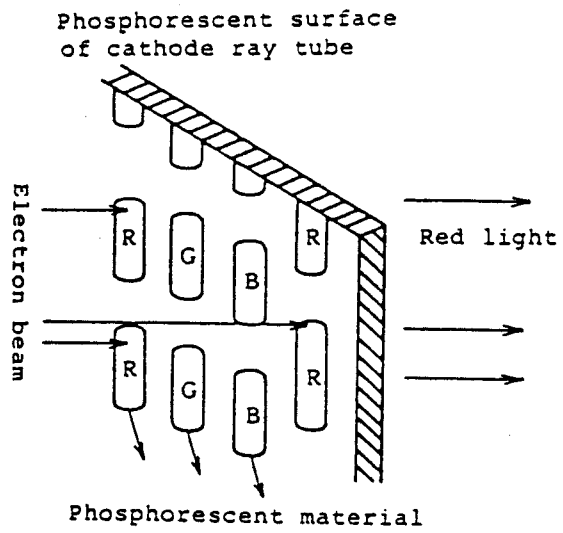


Fig.61

5-4. Three Elements of Color

The three elements of color are:

1) Brightness

2) Hue

3) Saturation

* Brightness: Relative strength of visible light that enters the human eye.

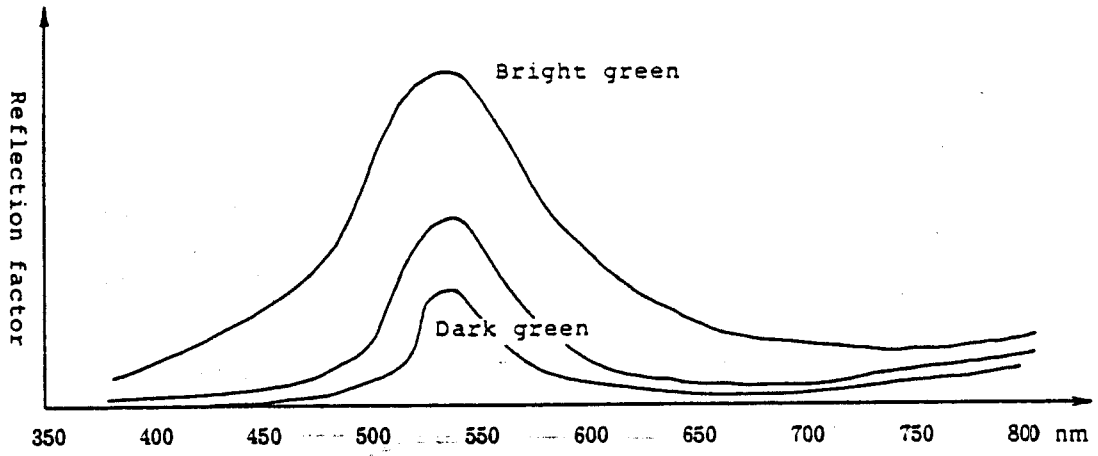


Fig.62

* Hue: Perception of red, orange, yellow, green, blue, or violet when the wavelength of the visible light entering the human eye is near a certain region.

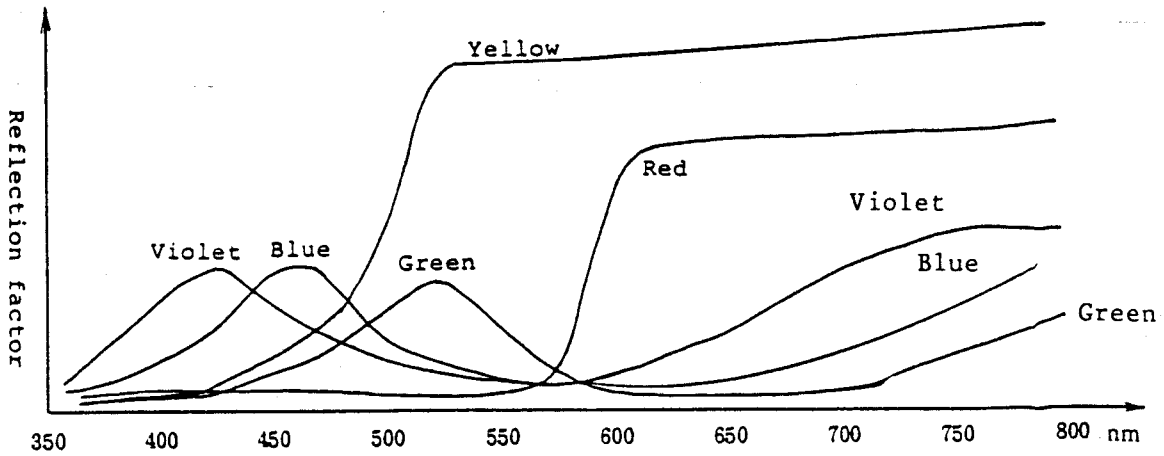


Fig.63

* Saturation: Vividness of a color. Decrease in saturation refers to the change from vivid green through impure green to gray.

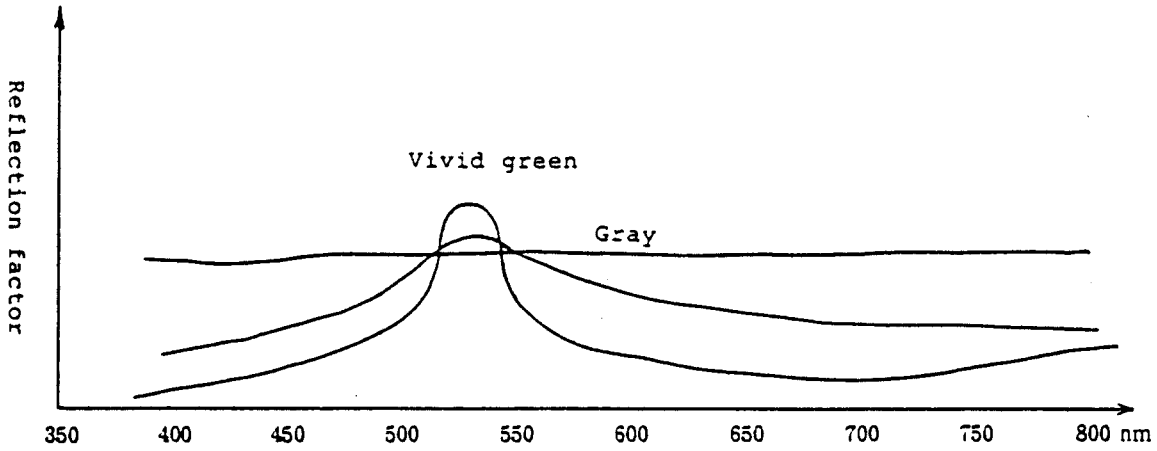


Fig.64

5-5. Additive Mixture of Color and Subtractive Mixture of Color

There are two methods of producing natural color: the additive mixture of color (color TV, color liquid crystal TV, etc.) and the subtractive mixture of color (color printing).

1) Additive Mixture of Color

The three primary colors for additive mixture of color are red (R), green (G), and blue (B).

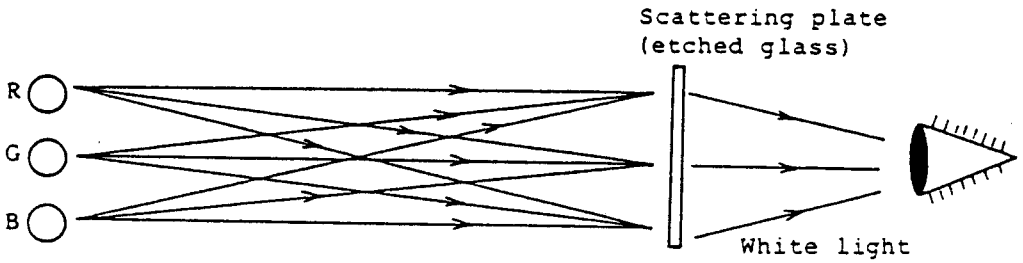


Fig.65

In the figure above, if the three lamps, R, G, and B, are all off, nothing will be seen. Next, if only the R lamp is turned on, red is perceived. Then if the G lamp is also

turned on, yellow is perceived. Finally, if the B lamp is also turned on, a bright white is perceived. Since a brighter color is perceived as more light is added (increase in light energy), this is called "additive mixture of color."

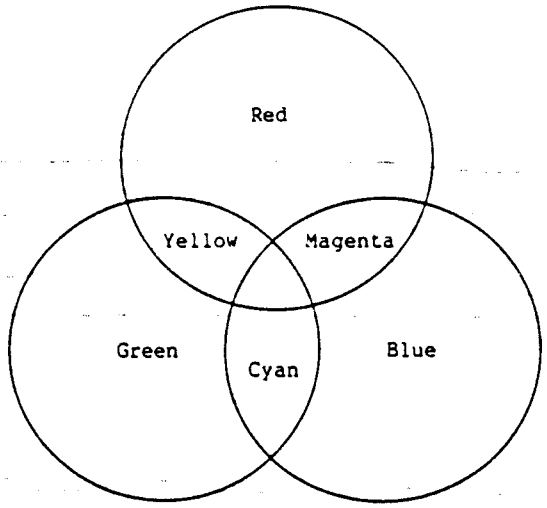


Fig.66

2) Subtractive Mixture of Color

The three primary colors for subtractive mixture of color are yellow, magenta, and cyan.

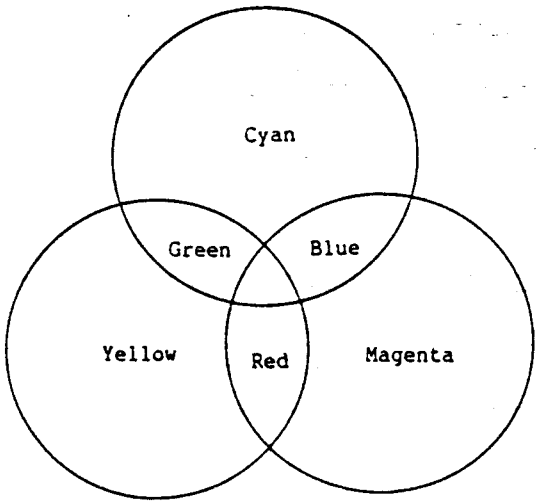


Fig.67

In the figure above, the part that is not printed with any ink is a bright white. The part printed only with yellow ink is perceived as yellow and the part printed with over-

lapping yellow and cyan inks is perceived as green. Further, the part printed with overlapping yellow, cyan, and magenta inks is perceived as black.

Since the color becomes darker as ink is overlapped, this is called "subtractive mixture of color." In reality, however, printing with overlapping yellow, magenta, and cyan inks does not produce a pure black color. Usually, a black ink is added to the three inks and printing is done with four inks.

5-6. Scanning Method (color scanner)

There are many scanning methods employed in color scanners currently available on the market such as drum, filter, triple sensor, contact sensor, triple light source, and many others. The triple light source method is employed in this copier.

5-6-1 The features of the triple light source method are given below.

(Advantages)

- Simple mechanism.
- The RGB color separation is ideal.
- Matches well with the RGB of color TVs.
- Adaptable to the speed of the host machine. (All that is needed is a one-line buffer memory at the host.)
- Pure phosphor is used for stable colors.

(Disadvantages)

- Slightly slow speed. (60 seconds/A4)

5-6-2 Fundamental Principles

Basically the copier consists of R, G, and B fluorescent lamps, large R and B filters, a small W filter (visible light transmission filter), and one high density CCD sensor (3648 elements). Further, the addition of an option unit

combining 2 mirrors also enables scanning of transparent originals.

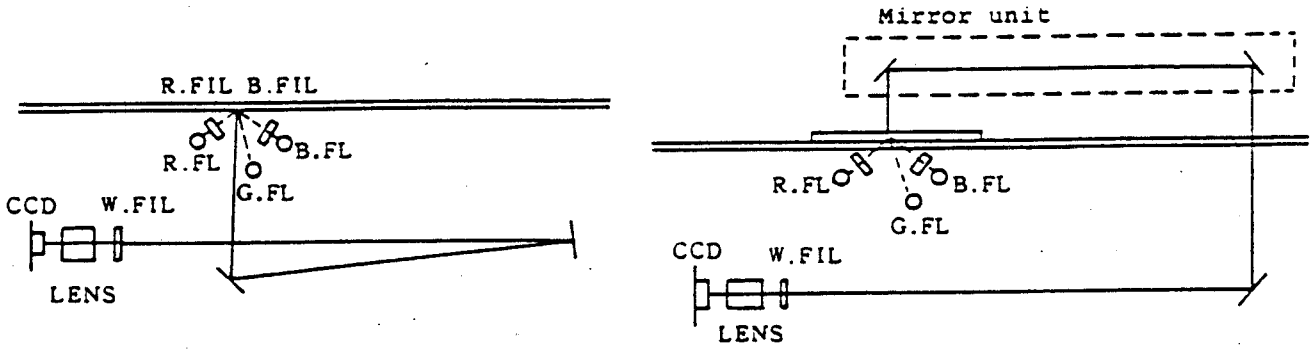


Fig.68

In this method, the RGB lamps are flashed in sequence so that data for the three pure colors can be obtained from a single image sensor output. The figures below show the spectral characteristics of the light emitted from the RGB lamps and the relationship between the timing of the RGB lamp flashes and the CCD output. (The horizontal axis in the timing chart represents the time.)

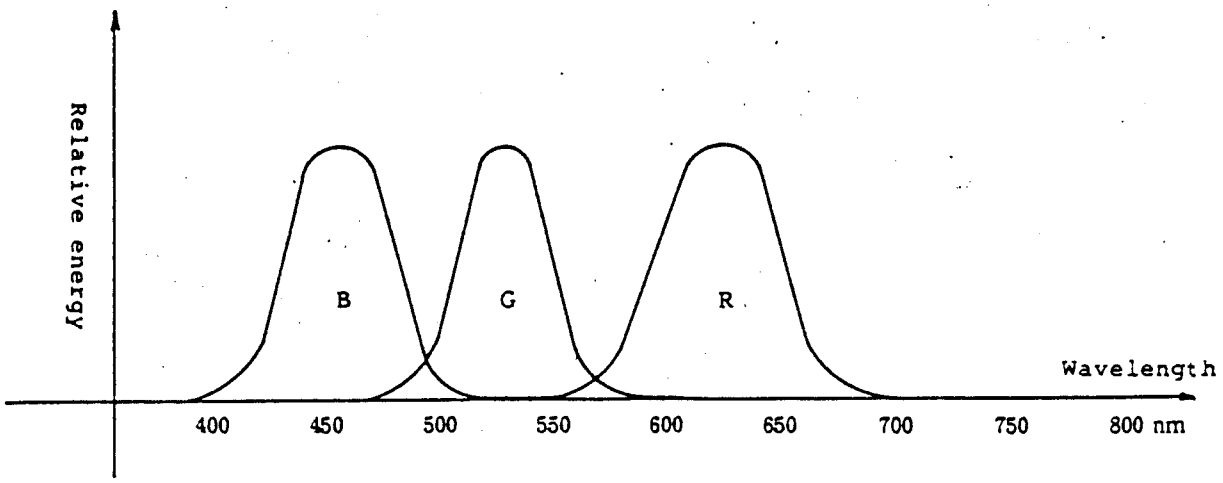
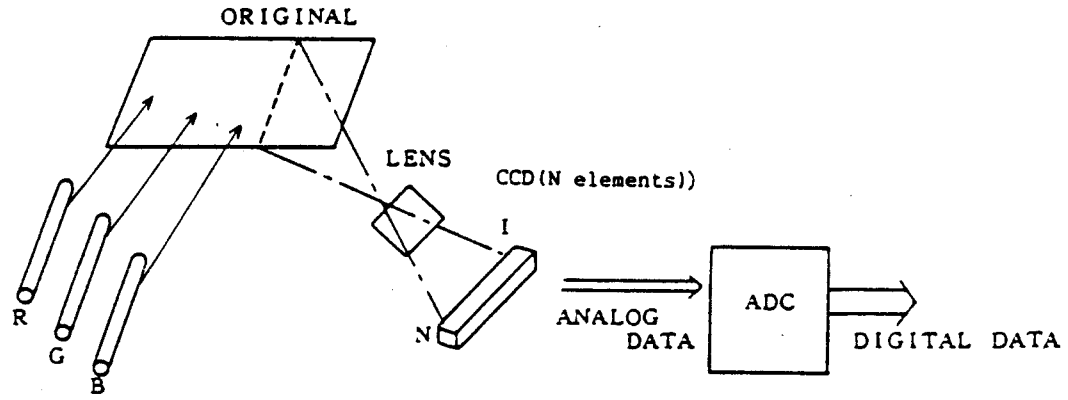


Fig.69



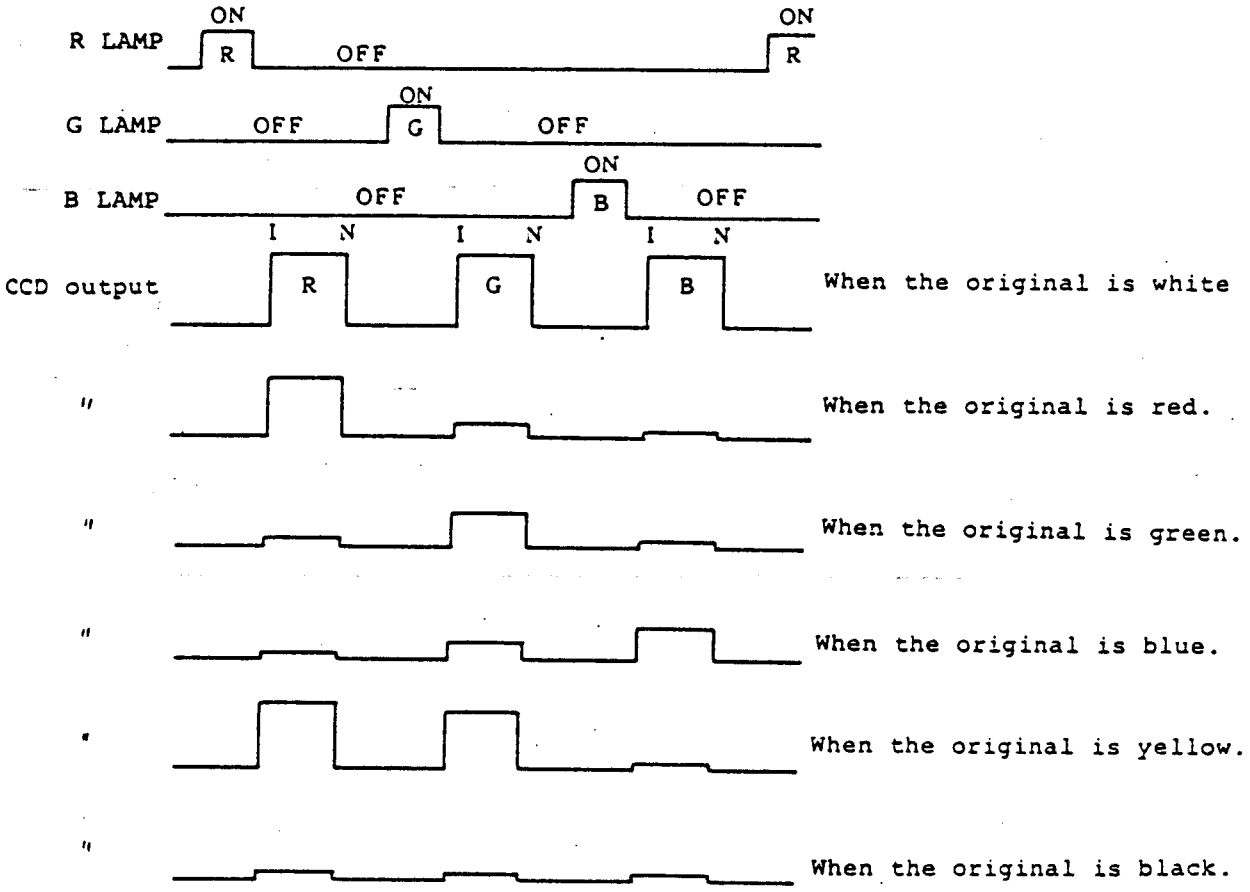


Fig.70

5-6-3 RGB Color Separation Characteristics

The RGB color separation characteristics of the color scanner is determined by the combinations given below.

(a) R characteristic: R fluorescent lamp, R filter, W filter, CCD

(b) G characteristic: G fluorescent lamp, CCD

(c) B characteristic: B fluorescent lamp, B filter, W filter, CCD

The color separation characteristic for each part is shown in the following.

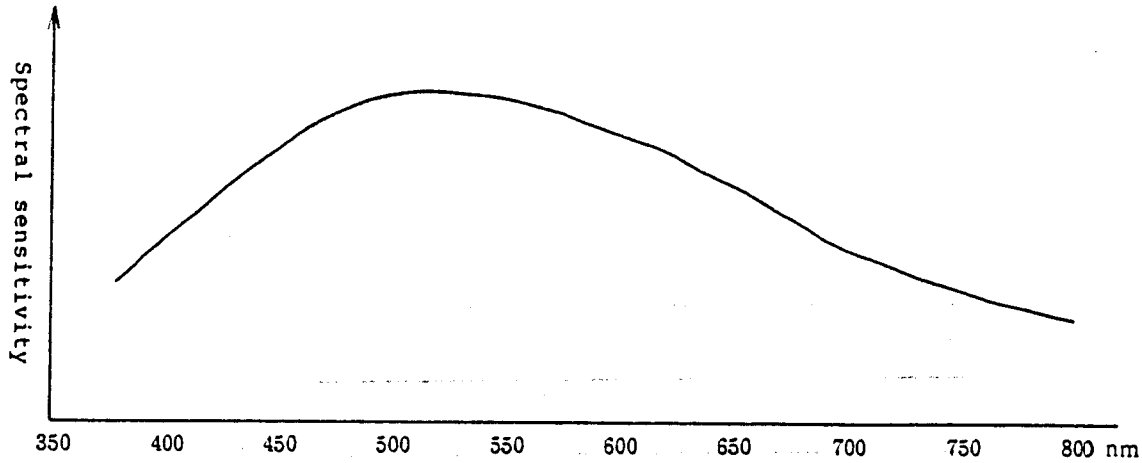


Fig.71 CCD (spectral sensitivity)

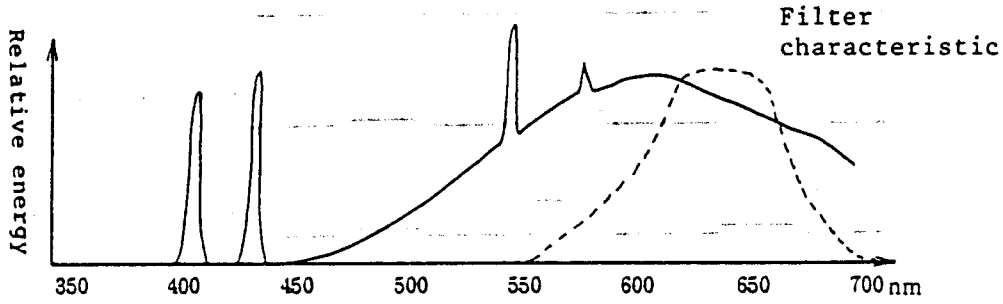


Fig.72 R fluorescent lamp

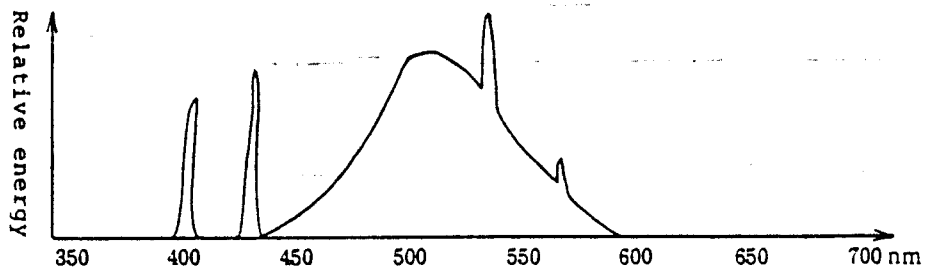


Fig.73 G fluorescent lamp

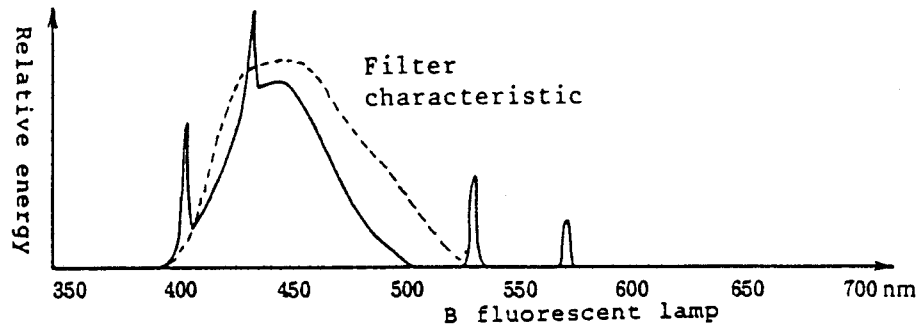


Fig.74 Fluorescent Lamps

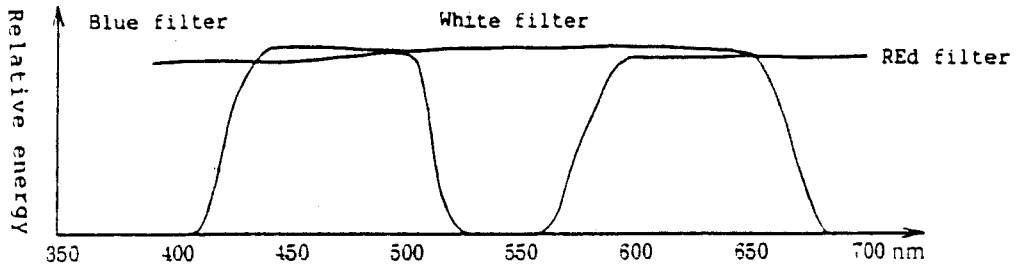


Fig.75 R, B, and W filters

Among the three RGLB fluorescent lamps, the phosphorescence decay time of the R and B fluorescent lamps are short (10 sec or less) and the phosphorescence decay time of the G fluorescent lamp is long (approximately 10 msec). Therefore, for fast scanning, the G fluorescent lamp is turned on first and before its phosphorescence decay time ends, the B fluorescent lamp is turned on and then the R fluorescent lamp. In this method, the phosphorescence decay component of the G fluorescent lamp overlaps the sensor output corresponding to the B fluorescent lamp or R fluorescent lamp. The phosphorescence decay component of the G fluorescent lamp is subtracted by a circuit. This subtraction is shown in the following.

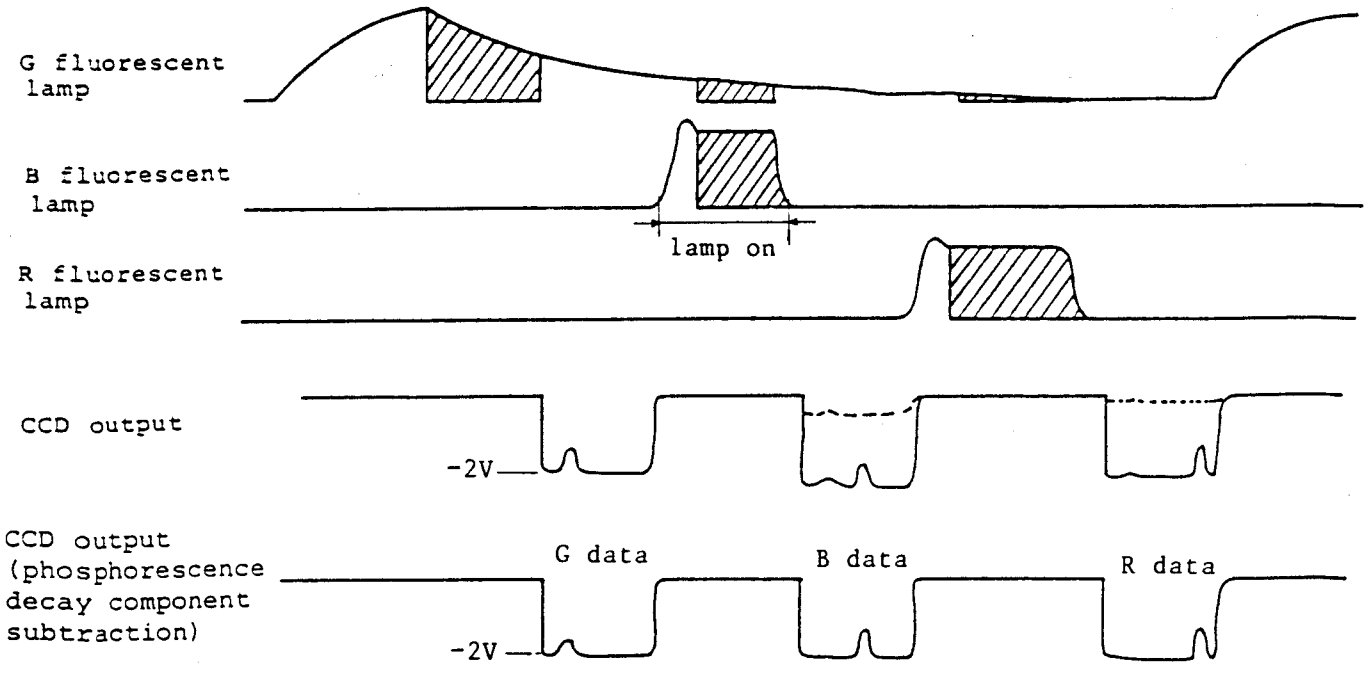


Fig.76

6 Operational description

For the JX450, three light sources of red, green, and blue are used; each one activated one at a time according to the predetermined timing. The lights reflected or transmitted through the original on the table are received by a single image sensor and the color information of the original is divided into RGB components. The RGB data are analog to digital converted and go through correction blocks, of which outcomes are delivered as RGB information to an external device via the GPIB interface.

Fig.77 shows the block diagram of the JX450.

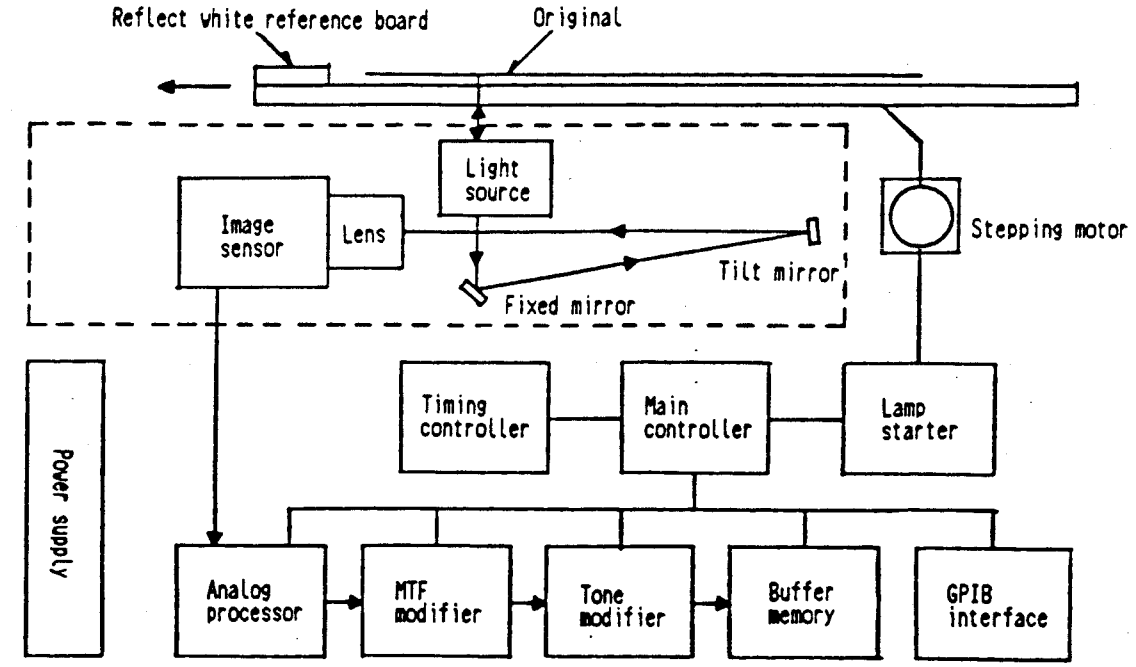
When the JX450 is started to operate by the host computer, the operation mode is set in the JX450 and the original table advances to the white reference position at the right of the machine under the control by the main control unit and timing controller, where it refers to the white reference board to determine the following:

(1) Memory of dark noise component and modification
(2) Adjusting light intensity from the R, G, B light sources
(3) Memory of green residual component and modification
(4) Memory of shading component and modification.

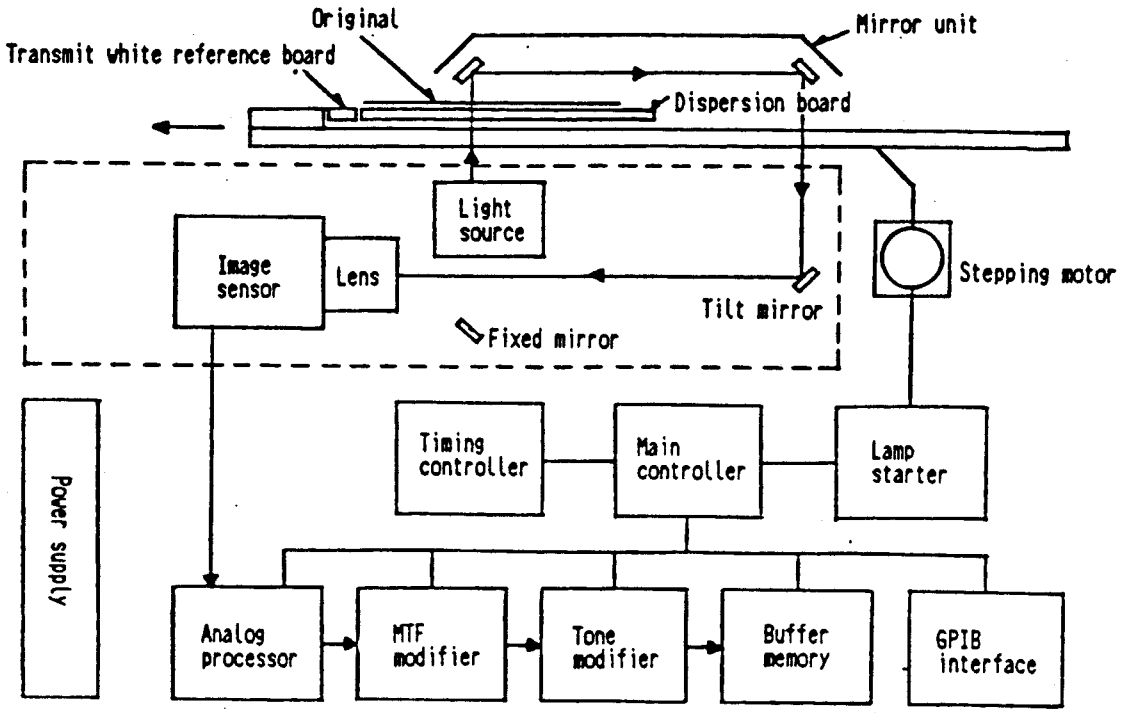
6-1 Scanning operation

Discussion will be given about the scanning operation in reference to signal flow.

Three fluorescent tubes of red, green, and blue are employed in the light source; each one quickly flashing to expose the original. In the reflect mode, the light reflected from the original surface changes its course on the fixed mirror and tilt mirror and focuses image on the image sensor through the lens. In the transmit mode, the light transmitted through the original changes its course on the two mirrors of the transmit copy unit and the tilt mirror to focus image on the main sensor through the lens. A CCD linear image sensor is employed for the image sensor. The image focused by the lens is divided into picture elements by the sensor, to perform scanning in the main scan direction. For scanning of the sub-scan direction, a stepping motor is used to move the original table under the control of the main controller.
The analog information divided into individual picture element is amplified in the differential amplifier and subjected to dark noise and green residual component and shading corrections in the analog processor, to be converted from analog to digital signal. The data thus converted go through the MTF correction and tone correction and written in the buffer memory. When the RGB digital data of one line are written, the main controller sends out the RGB data to the external device via the GPIB interface.
The scanner repeats the above operation until data of one frame is sent out. When it has been complete, the fluorescent tubes stop activating and the original table returns to its home position to go into the ready state.



(a) Reflect mode



(b) Transmit mode

Fig.77 Color scanner block diagram

6-2. Correction

As shown in Fig.75, the data sent from the CCD is corrected as explained below.

6-2-1. Analog correction

(1) Dark noise correction
Dark noise when COD is not receiving light is corrected by referring to the white reference board while the fluorescent lamp is not on, thus subtracting so much from the actual scan data.

(2) Adjusting the intensity of RGB light source
With fluorescent lamps R, G, and B on, the light intensity of each lamp is adjusted when the white reference board is scanned. Further, G fluorescent lamp is adjusted independently because of its long afterglow period, while B and R lamps are adjusted at the same time.

(3) G afterglow correction
Since the G fluorescent lamp has a long afterglow period as explained in 5-6-3, the afterglow still remains even when B and R fluorescent lamps started to be active.
Therefore, at the time of WD scan, G afterglow component is memorized and synthesized with G scan data, by which B scan data and R scan data are subtracted from.

(4) Shading correction

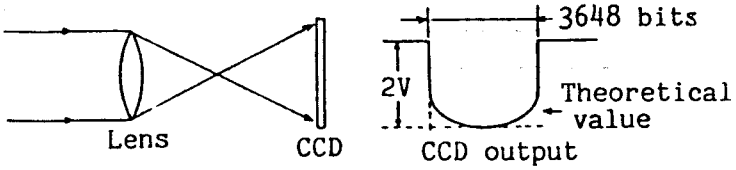
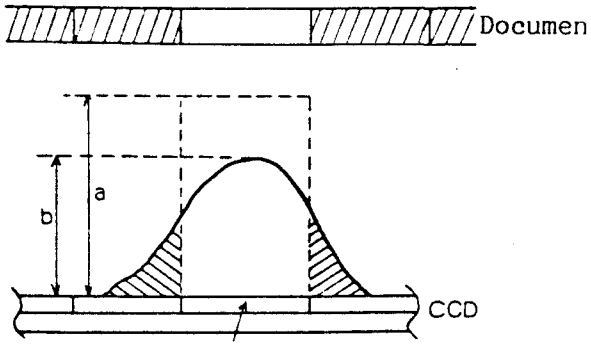


Figure 76

Since the CCD receives light through a lens as shown above, the area closer to the CCD receives low intensity of light; accordingly corresponding CCD output to that area decreases. So, the voltage of each pixel (3648 bits) is stored in the memory at the time of WB scan, and the real scan data is divided into 256 divisions (A-D conversion) on the basis of this voltage value. In this manner, the shading component is corrected.

6-2-2. MTF correction

MTF is a short word for modulation transfer function (resolution), meaning an optical transfer characteristic in regard to this manual.



a, b: Light intensity

Figure 77

In an optical system, out of focus is present even after complete focal adjustment has been made. Therefore, when each pixel of the CCD receives reflective or transparent light, light leaks to the adjacent pixels on account of the above optical characteristic. On the other hand, lights leaking are also received. MTF correction is done by adding the leaking light and subtracting the light received from sides.

6-2-3. Tonal correction (gamma correction)

Tonal correction is a correction for converting the digital data of 256 kinds into a pattern of data. It is normally used to accent dark part (see "a" in the figure below).

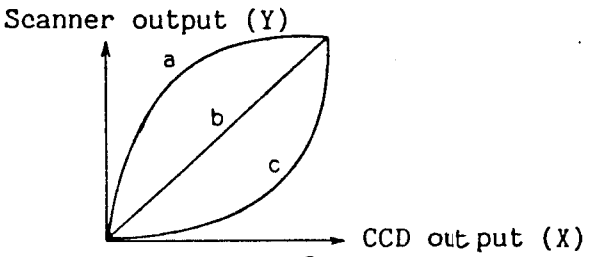


Figure 78

(Note) "a" is to accent dark part (Y=X0.45 for CRT).
"b" is the CCD output itself (Y=X).
"c" is to accent bright part.

IV DESCRIPTION OF EACH BLOCK

Except the mechanism, the JX450 consists of the following components:

7 Optical system

The optical system consists of the three color light sources (red, green, blue), mirrors, lens, and CCD sensor.
Shown below is a block diagram.

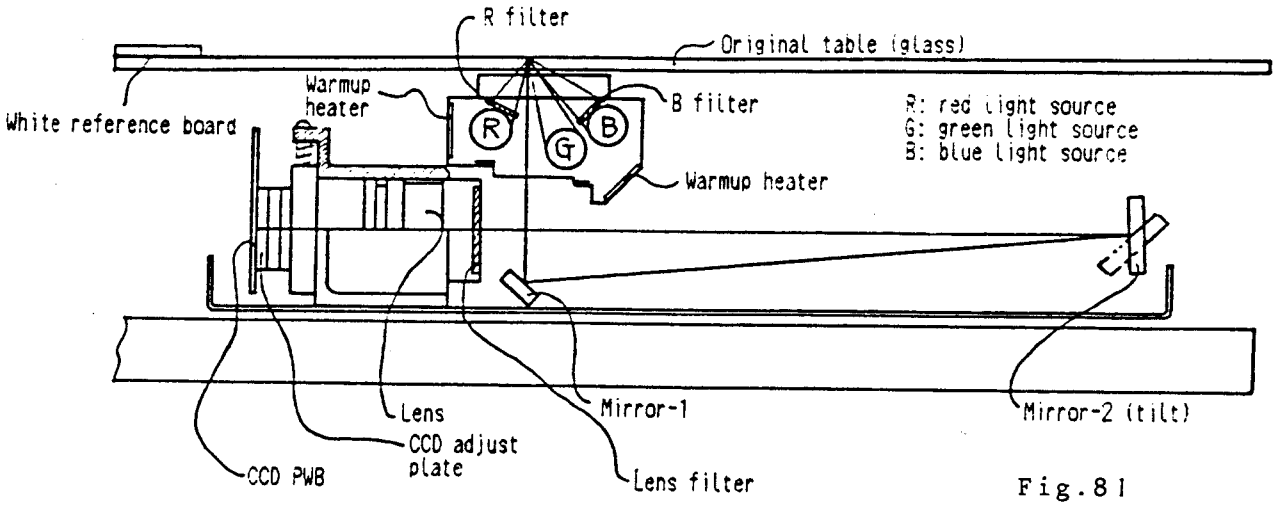


Fig.81

When the START switch is pressed after placing an original on the original table (glass), the original table starts to move to right and refers to the white reference board that locates on the left side of the original table, then goes into the scanning action. The light reflected from or transmitted through the original reaches the CCD sensor via the mirror-1, mirror-2, and the lens.
Lamps come into activation in sequence of green, blue, and red, whose CCD output for each color is processed and color separated.

7-1 Light source

Three fluorescent tubes of red, green, and blue are used. A red filter is used for the red light source and a blue filter for the blue light source to optimize the spectrum characteristics. For the characteristics of a fluorescent tube is affected by the temperature, the fluorescent tube is housed within a compartment in which provided a warmup heater, to control the lamp ambient temperature.
Three fluorescent tubes are housed within one compartments, it has to be replaced by a whole unit.

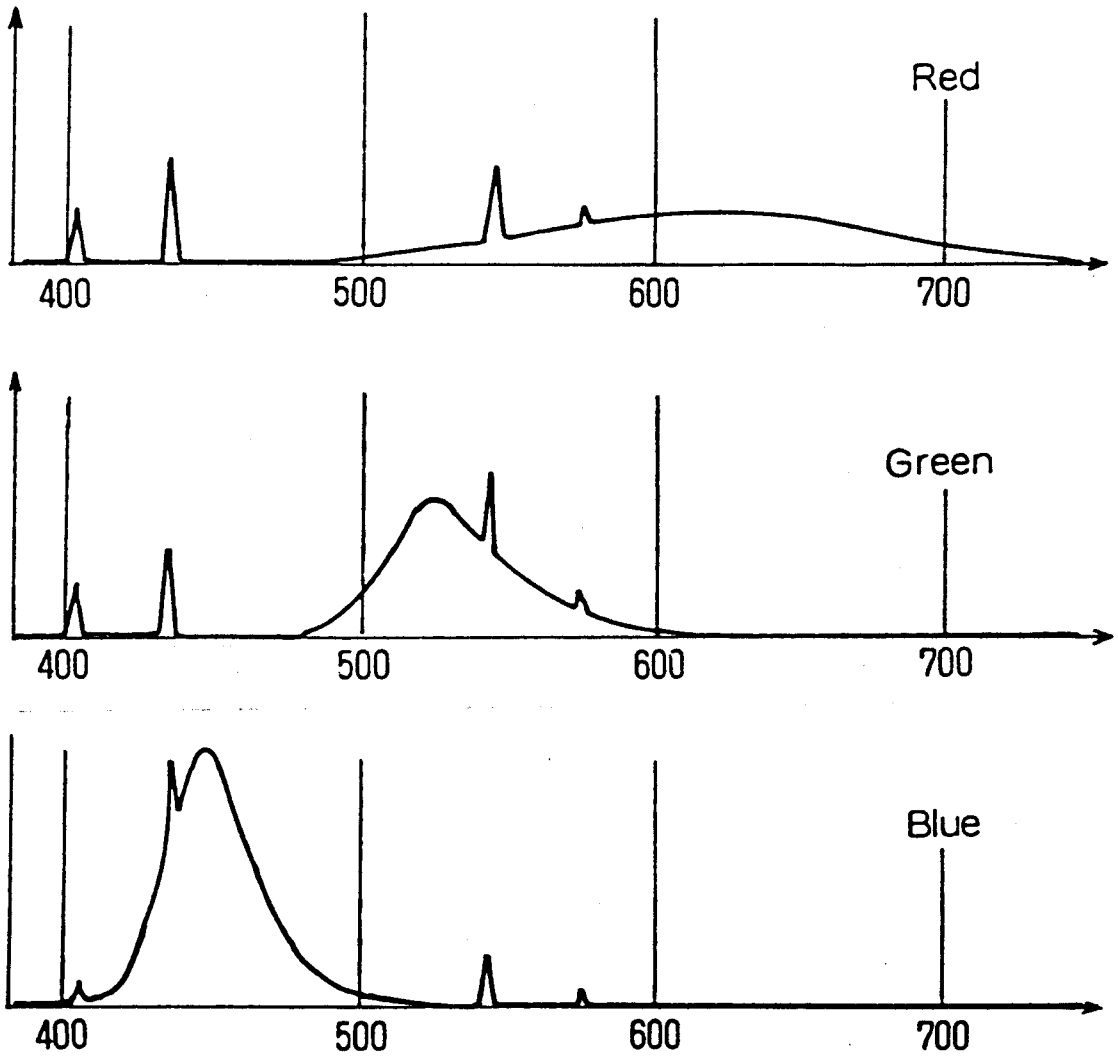


Fig.82

Characteristics of each lamp

7-2 Mirror

Two kinds of mirrors are used: the mirror-2 is a tilt type which is used to select the optical path in the transmit copy mode when copying a transparent original such as OHP film.

7-3 Lens

An F3.2, f=50mm lens is used. For there is a variation in the focus distance within a range of ±1%, the magnification ratio is adjusted using the CCD adjusting plates (0 to 4 pieces). As the lens has the directivity, a marking is provided along with the focus distance variation.

Mark	Adjust plate	f value variation
0	0 pc	f -1.00 to -0.33(%)
1	2 pcs	f ±0.33
2	4 pcs	f +0.33 to +1.00

Table-6

7-4 Filter

● Red filter

The red filter is installed in front of the red light source and its spectrum characteristics is shown in the figure right.

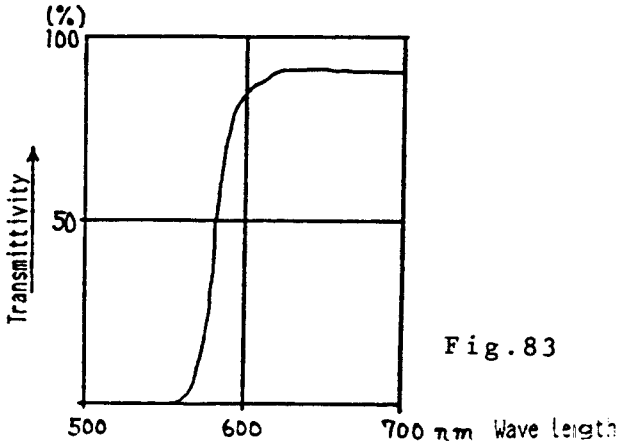


Fig.83

● B filter

The blue filter is installed in front of the blue light source and its spectrum characteristics is shown in the figure right.

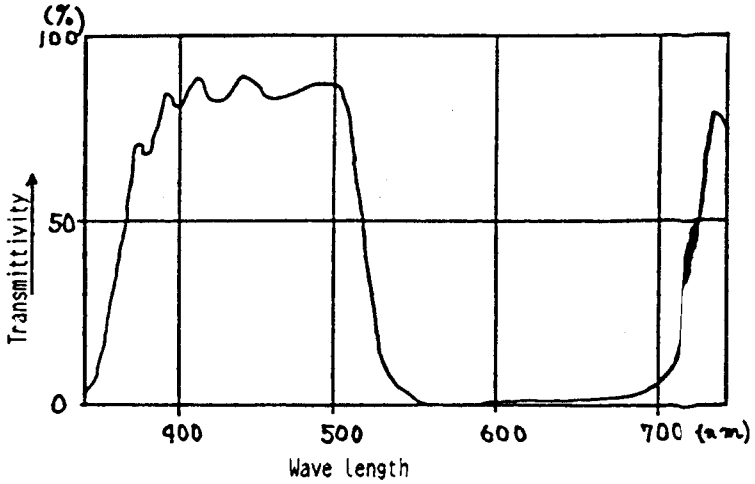


Fig.84

● Lens filter

The lens filter is assembled inside the lens and its spectrum characteristics is shown in the figure right.

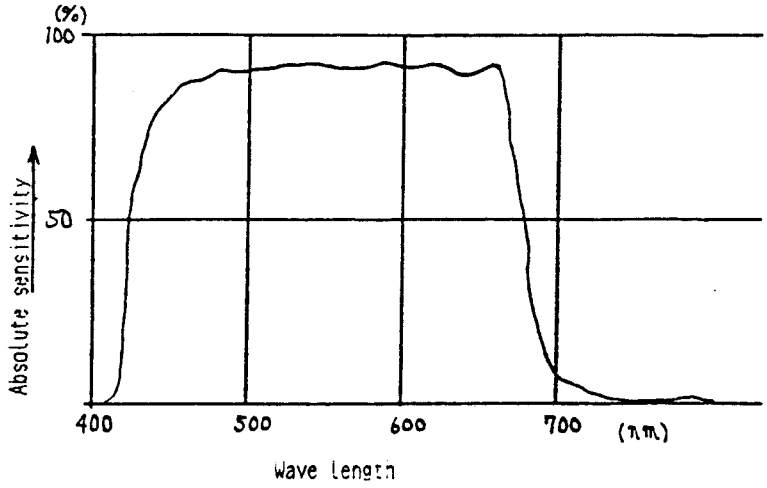


Fig.85

Colors are separated using the above three filters and RGB fluorescent tubes.

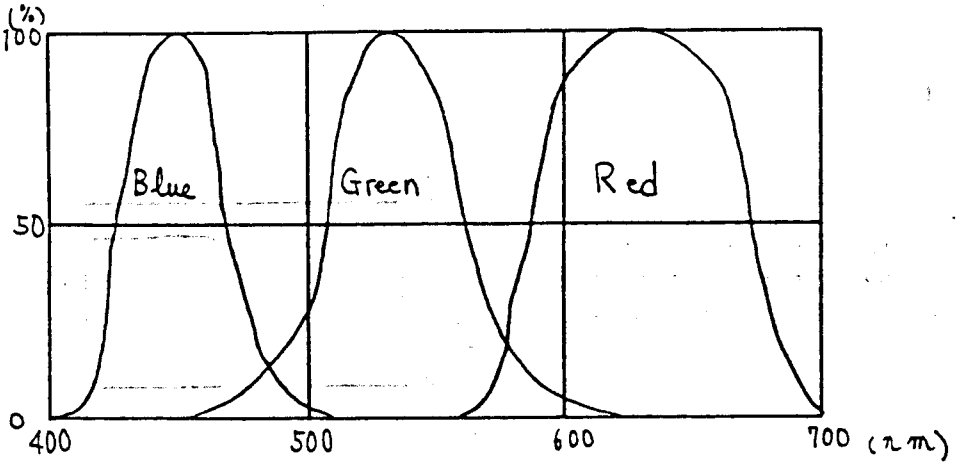


Fig.86

R, G, B color separation characteristics

7-5 Image sensor

The TCD105C is used for the image sensor. It employs a ph photodiode incorporated highly sensitive CCD linear image sensor and 3648 pieces of 8μm×8μm elements are arranged straight to scan an A3 size paper under the resolution of 300 dpi (about 12 dots/mm).
Table 7 shows the electrical and optical characteristics of the TCD105C, Fig.87 spectrum characteristics, and Fig.88 drive timings.

Table 7 Electrical and optical characteristics

Electrical and optical characteristics

(Ta=25℃, VOD=VIS=12V, VIG=0V, Vφ=VRS=VSH=12V (pulse), fφ=0.5MHz, fRS=1MHz, tINT (optical signal store time)=100msec, light source=daylight fluorescent lamp)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Sensitivity	R	---	0.5	0.7	1.0	AV/lx-S
Sensitivity unevenness	PRNU	(NOTE-1)	---	---	±10	%
Saturated output voltage	VSAT	VOD=11.4V	600	800	---	mV
Saturated exposure rate	SE	---	0.6	1.0	---	lx-SEC
Dark area output voltage	VDRK	VOD=13V	---	1.6	10	mV
DC power consumption	PD	VOD=13V	---	100	150	mW
Entire transfer efficiency	TTE	---	90	95	---	%
Output impedance	Z0	---	---	0.5	1.0	KΩ
Dynamic range	DR	VSAT/VDRK	---	500	---	
Signal/modify output dc voltage difference	IVOS-VDOSI	---	---	---	300	mv

NOTE:
PRNU is defined with the following expression:
The means output amplitude of the entire effective picture elements is determined to be $\overline{X}$ when an even light is on the photoconductive layer. And the absolute value of the difference with the amplitude of the maximum (minimum) output picture element $\overline{X}$ is determined to be ΔX:

$$PRNU = \Delta X / \overline{X} = 100 (\%)$$

Where, nominal saturated exposure rate of the exposed light is 50%.

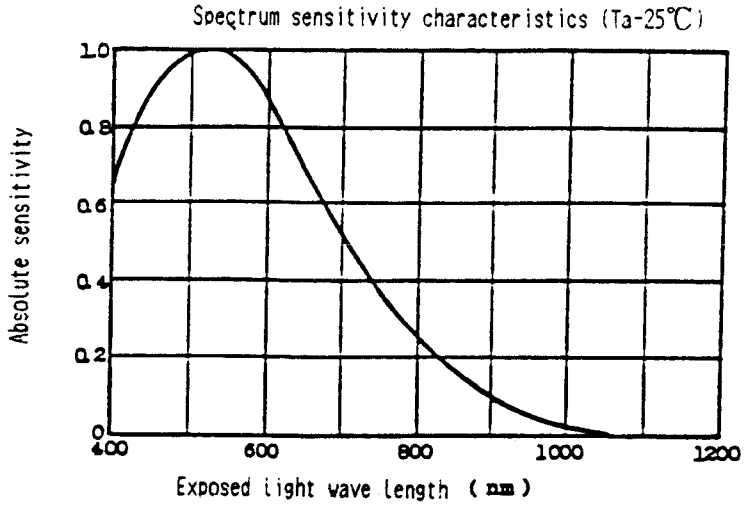


Fig.87 Spectrum sensitivity characteristics

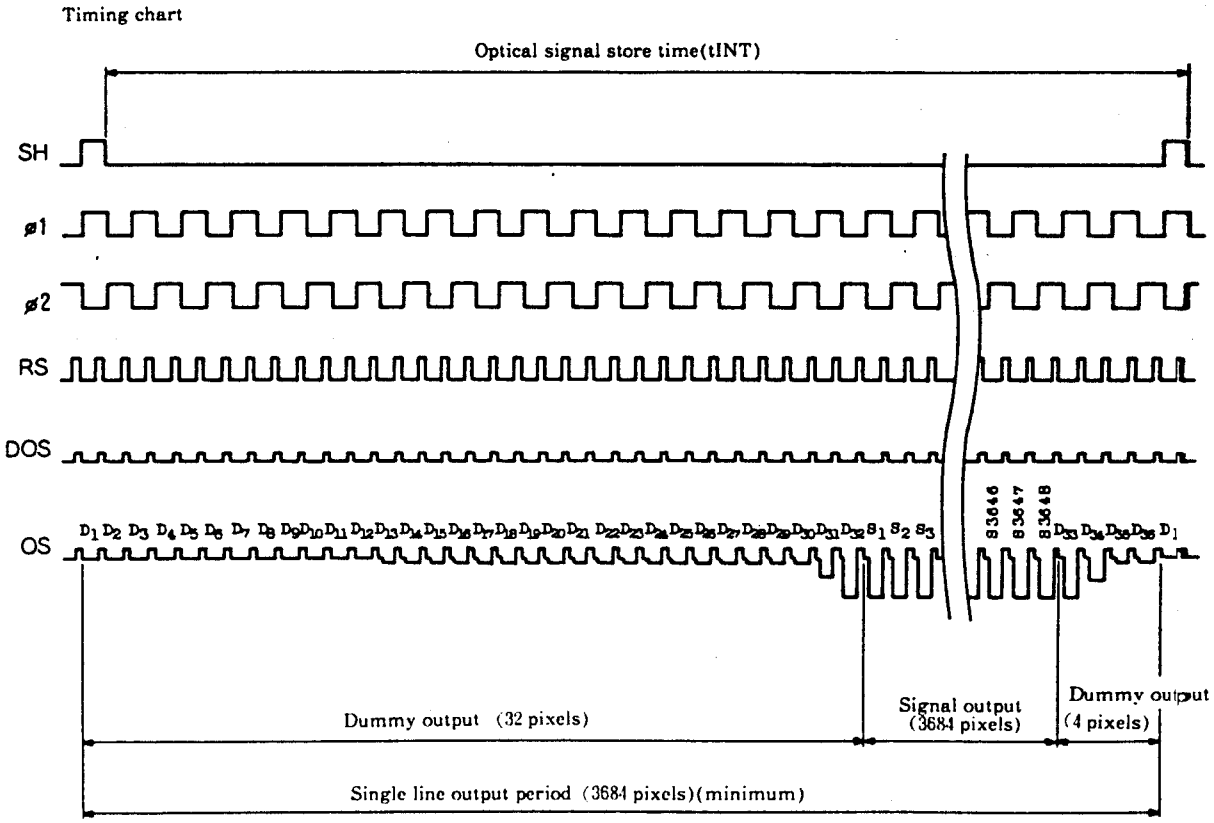


Fig.88 Drive timings

8 Control system

The control system takes care of operational control, scan signal processing, and signal interface with external device.

(Configuration)

The control system consists of the following blocks:

(1) The main controller which controls the system operation.
(2) The timing controller which controls signal timings.
(3) The analog signal processor which performs analog correction of the scan signal and analog to digital conversion.
(4) The MTF modifier which performs edge emphasize of the scan data.
(5) The tone modifier which performs gamma correction of a single line scan data.
(6) The buffer memory which stores a single line scan data.
(7) The GPIB interface which performs data transfer with the external device.

Fig.89 shows its block diagram.

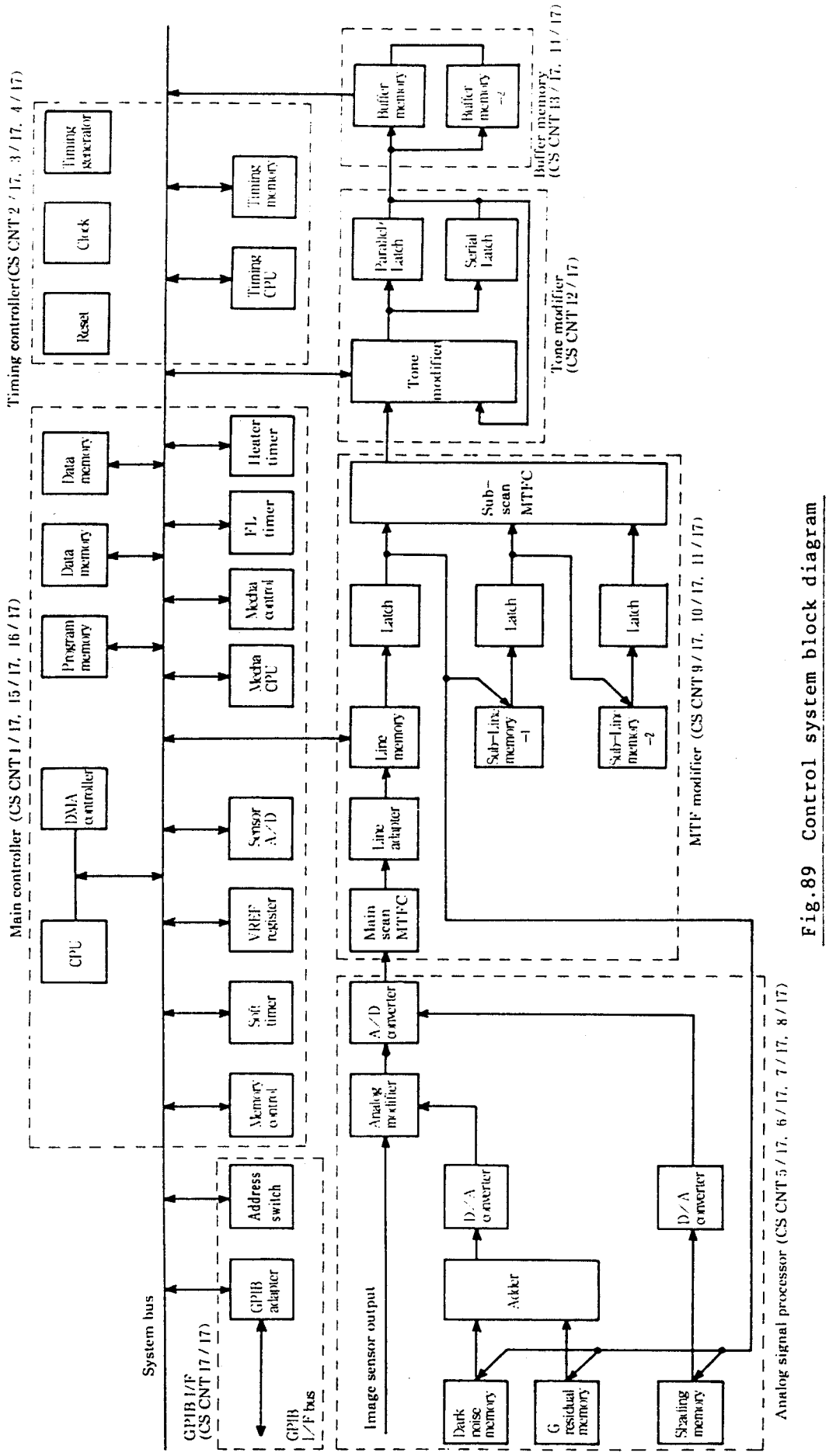


Fig.89 Control system block diagram

8-1 Main controller

1/17, 15/17, and 16/17 of the CS CNT circuit correspond to the main controller.
In the main controller, the Z80B is used for the main CPU and the μPD8257-2 for the DMA controller and operated under the 5MHz clock frequency. The DMAC will respond to a data transfer request from the GPIB adapter. Tables 8 and 9 show the address allocation for the device memory and I/O area under the control of the main CPU.

Table 8 Memory allocation

Address allocation	Name (IC NO)	Accessing condition	Function
0000H to 3FFFH	Program memory (135)	$\overline{\text{PGROM}}$	Stores the operational sequence.
4000H to 5FFFH	Data memory (127)	$\overline{\text{DTRAM}}$	Temporary register
6000H to 67FFH	Data memory (112)	$\overline{\text{DTROM}}$	Stores operational parameter.
8000H to 8FFFH	Timing memory (77, 78)	$\overline{\text{TIMM}}$ -TENB	Stores timing control data. Generates control timing.
A000H to BFFFH	Tone memory (62)	$\overline{\text{TONH}}$-ENBTM	Stores tone control data. Controls scan data tone.
C000H to FFFFH	Line memory (125, 133)	$\overline{\text{LINM}}$ (ENBLM at low)	Stores scan data.
	Buffer memory-1 (49, 56)	$\overline{\text{BUFM}}$ -CHBM (ENBLM at high)	Stores scan data.
	Buffer memory-2 (8, 15)	$\overline{\text{BUFM}}$ - $\overline{\text{CHBM}}$ (ENBLM at high)	Stores scan data.

Table 9 I/O allocation

Address allocation	Name (IC NO)	Accessing condition	Function
00H	DMA controller (171)	$\overline{DMAC}$	CH0 DMA top address, corresponds to R.
01H			CH0 DMA transfer bytes, corresponds to R.
02H			CH1 DMA top address, corresponds to G.
03H			CH1 DMA transfer bytes, corresponds to G.
04H			CH2 DMA top address, corresponds to B
05H			CH2 DMA transfer bytes, corresponds to B.
06H			
07H			
08H			DMAC operating mode setup, DMAC status check
10H	Timing (86)	$\overline{TCPU}$	Scan timing control
11H			
20H	Mecha (185)	$\overline{MCPU}$	Stepping motor control
21H			
30H	Memory (178)	$\overline{CPPI}$	Memory operating mode control
31H			Scanner operating mode setup
32H			Amp gain control, timer status check
33H			Mode setup

Address allocation	Name (IC NO)	Accessing condition	Function
40H	Mecha control (11)	$\overline{MPPI}$	fan, ADC power supply, panel LED control
41H			Panel LED control
42H			Heater on/off, fluorescent tube control
43H			Mode setup
50H	Soft timer (166)	$\overline{SFTM}$	1ms clock timer clock generation
51H			200ms clock timer
52H			1ms clock timer
53H			Mode setup
60H	FL timer (148)	$\overline{FLTM}$	R fluorescent tube time control
61H			G fluorescent tube time control
62H			B fluorescent tube time control
63H			Mode setup
70H	Heater timer (175)	$\overline{HTTM}$	10ms clock timer clock generation
71H			10ms clock timer
72H			Fluorescent tube preheat off time control
73H			Mode setup
80H	VREF register (143, 151)	$\overline{REFM}$	A/D conversion reference voltage generation for R
81H			A/D conversion reference voltage generation for G
82H			A/D conversion reference voltage generation for B
83H			A/D conversion reference voltage generation for monochrome mode

Address allocation	Name (IC NO)	Accessing condition	Function
90H	Sensor A/D (182)	$\overline{SADC}$	Light source compartment temperature monitor
91H			Machine interior temperature
92H			
93H			
94H			
95H			
96H			
97H			
A0H	GPIB adapter (16)	$\overline{GPIB}$	Interrupt Status 0 checking Mask 0 setting
A1H			Interrupt Status 1 checking Mask 1 setting
A2H			Address status checking
A3H			Bus status checking General purpose command setting
A4H			GPIB address setting
A5H			Serial polling
A6H			Command path through parallel polling
A7H			Data in register Data out register
B0H	Address switch (4)	$\overline{IBAD}$	Address switch and test switch sense

8-2 Timing controller

The CNT CNT circuit diagrams correspond to the timing controller. The timing controller consists of the following blocks:

(1) Reset circuit...upper part of CS CNT 2/17
(2) Clock circuit...lower part of CS CNT 2/17
(3) Scan timing control circuit...left side of CS CNT 3/17
(4) Data access timing control circuit...right side of CS CNT 3/17
(5) Data access timing generation circuit...CS CNT 4/17

A single chip microprocessor is contained in the scan timing control circuit for the control of the scan timing according to the data sent from the main microprocessor. This single chip microprocessor is called timing CPU (IC86). Table 10 shows the function of the control signals issued from the timing CPU and Fig.91 describes the scan timings.
To add the scan line data in the low resolution mode, the timings shown in Fig.91 are repeated with the $\overline{\text{FSTL}}$ signal kept high level. The $\overline{\text{MTRG}}$ signal is used to control the stepping motor operation during the scanning operation and the original table advances 1/600 inches (about 1/24mm) with a single pulse of the signal. The stepping motor is controlled by the single chip microprocessor which is called mechanism control CPU (IC185).
A fast access momory (IC77, 78) called timing memory is used in the data access timing control circuit to control data access timing for the data sent from the main CPU. Table 11 shows the function of the control signal sent from the timing memory.

Table 10 Timing CPU output signals

Output pin	Signal name	Function
P27	$\overline{\text{FSTL}}$	A low on this line indicates that a single line of scan data is valid.
P25	$\overline{\text{MTRG}}$	For control of the stepping motor during the scan operation.
P17	RFLON	For control of red fluorescent tube activation timing
P16	GFLON	For control of green fluorescent tube activation timing
P15	BFLON	For control of blue fluorescent tube activation timing
P14	MS1	MS1=0, MS0=0 → R; MS1=0, MS0=1 → G; MS1=1, MS0=0 → B; MS1=1, MS0=1 → monochrome
P13	MS0	
P12	CLEAR	Timing clear and start up pulse
P11	ADSTS	A high on this line assumes the CCD output signal as a valid scan signal.
P10	CLMP	A high on this line clamps the scan signal to the GND level.

Table 11 Timing memory output signals

Output pin	Signal name	Function
D7	FAST	Used to select fast (H) and normal (L) timing.
D6	$\overline{ADD}$	A low on this line adds the basic pixels in the main scan direction.
D5	$\overline{CHTL}$	High at all times.
D4	$\overline{WMEN}$	A low on this line enables to write green component memory.
D3	$\overline{CMEN1}$	A low on this line enables to read dark noise memory, green residual memory, green component memory.
D2	$\overline{CMEN2}$	A low on this line enables to read shading memory.
D1	$\overline{LMEN}$	A low on this line enables to access line memory.
D0	$\overline{BMEN}$	A low on this line enables to access buffer memory.

A high on ADSTS or CLMP permits output from the timing memory.
The data access timing generation circuit delivers the CCD sensor drive timing signals and memory access timing signals under the control of the timing control circuit. Table 12 shows timings and its function. A high on the FAST line enables the counter F (IC101) to issue the fast timing. When FAST is at a low, the counter S (IC94) is enabled to deliver normal timing. When the normal timing is on, the timing control shift register (IC130) is enabled to permit A/D conversion and memory write.

Table 12 Data access timing output signals

Signal name	Function
$\overline{\phi T}$	CCD transfer pulse
$\overline{\phi 1}$	CCD shift clock
$\overline{\phi 2}$	CCD shift clock
$\overline{\phi R}$	CCD reset pulse
TSH	Sample hold signal (active high)
ADCK	A/D conversion clock (on at a low to high transition)
$\overline{MCLR}$	Memory address counter clear signal
$\overline{MCLK}$	Line memory and buffer memory address clock
$\overline{LMOE}$	Line memory and buffer memory $\overline{OE}$ signal
$\overline{LMWE}$	Memory $\overline{WE}$ signal
$\overline{ADEN}$	A low on this line enables to access dark noise memory.
$\overline{SDCK}$	Dark noise memory address clock
$\overline{SDOE}$	A low on this line sets it in the dark noise memory read mode.
$\overline{SDWE}$	A low on this line sets it in the dark noise memory write mode.
$\overline{SGEN}$	A low on this line enables to access green residual and green component memory.
$\overline{SGCK}$	Green residual and green component memory address clock
$\overline{SGOE}$	A low on this line sets it in the green residual and green component memory read mode.
$\overline{SGWE}$	A low on this line sets it in the green residual and green component memory write mode.
$\overline{SCEN}$	A low on this line enables to access shading memory.
$\overline{SCCK}$	Shading memory address clock
$\overline{SCOE}$	A low on this line sets it in the shading memory read mode.
$\overline{SCWE}$	A low on this line sets it in the shading memory write mode.

8-3 Analog signal processor

The CS CCD circuit diagram and CS CNT circuit diagrams 5/17, 6/17, 7/17, and 8/17 correspond to the analog signal processor.

The analog signal processor consists of the following blocks:

(1) CCD and amplifier...CS CCD 1/1
(2) Analog modifier...left side of CS CNT 5/17
(3) A/D converter...right side of CS CNt 5/17
(4) Dark noise memory...CS CNT 6/17
(5) Green residual memory...CS CNT 7/17
(6) Shading memory...CS CNT 8/17

Optical signal of each pixel formed on the CCD sensor through the optics is converted into electrical analog signal which is corrected by the dark noise modification, green residual modification, and shading modification processes, before being converted into electrical digital signal. Fig.90 shows its block diagram.

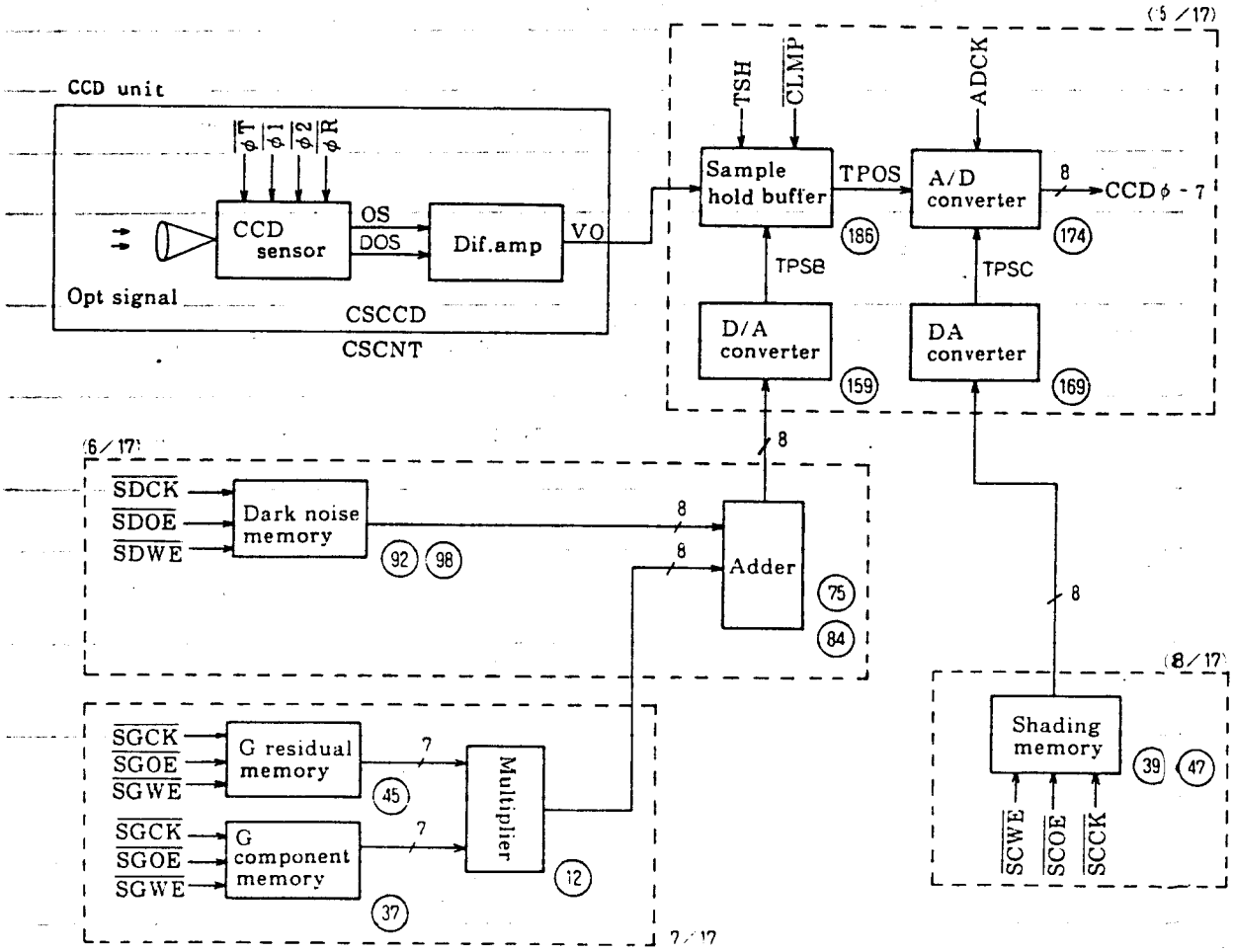


Fig.90 Analog signal processor block diagram

Since correction has not been done in the analog signal processor at first, the following operations, (a)~(d), take place under the control of the main controller and the timing controller before commencing the operation.

(a) Dark noise component store→modification

After the dark output component from the CCD sensor is written in the dark noise memory, modification is enabled. This is done by deducting the dark component from the amplifier output signal VO in analog mode.

(b) Green intensity adjustment/blue and red light intensity adjustment

Activation timing is determined in order of G, B, and R by referring to the white reference board, to adjust their intensity.

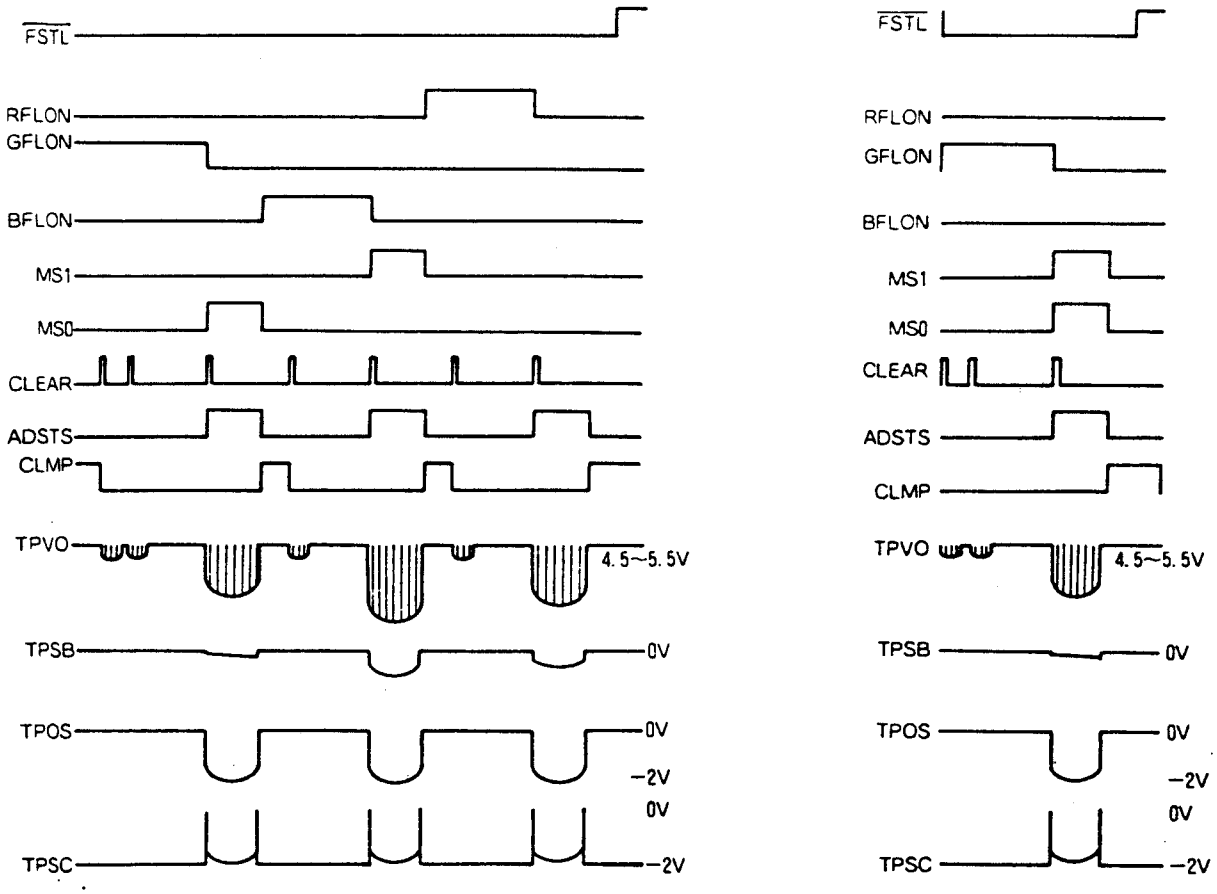
(c) Green residual component store→modification

After writing in the green residual memory the green residual component of the green fluorescent tube that sensed when the white reference board is scanned, correction is enabled. The green residual modification is the one that this green residual component multiplied by the green component written in each line and added with the dark noise component, which is the analog signal TPSB. Then, it is deducted from the amplifier output signal VO.

(d) Shading component store→modification

The shading waveform having decreased in its intensity around corners after sensing the white reference board is written in the shading memory and modification is enabled. The shading modification is done by dividing the sample hold buffer output signal TPOS by the shading signal TPSC.

After the above modifications have been all enabled, the scanner goes into scanning action and the analog signal processor also goes into the scanning operation.
The CCD sensor separates the image formed on the sensor pixel by pixel by means of the transfer pulse $\overline{\phi T}$, shift clock $\overline{\phi 1}$ and $\overline{\phi 2}$, and reset pulse $\overline{\phi R}$, to deliver the electrical analog signals DS and DOS. The differential amplifier amplifies these signals into output level (about 2V) that these output signals may be processed. The amplified signal VO is supplied to the sample hold buffer where subtracted by the sum of the dark noise component stored first in the memory and the green residual component. Then, sampled at a low to high transition of TSH, clamped to the GND level at a high to low transition, to be issued as TPOS signal.
The signal then goes into the A/D converter and compared with the shading signal TPSC which was stored first at a rising edge of ADCK, converted into digital signal, and sent out at a high to low transition of ADCK.



(a) At the time scanning color image (b) At the time scanning monochrome image

Fig 91 Scan tim ng vs. signal waveform

8-4 MTF modification

The CS CNT circuit diagrams, 9/17, 10/17, and 11/17 correspond to the MTF modifier.
In order to correct blur in the image that occurs in coming through the optical system, the value of the attention picture element is determined by means of the attention picture element and adjoining picture elements.
The following is achieved separately in the actual circuit to simply the circuit.

(1) Main scan direction MTF modification
(2) Sub scan direction MTF modification

8-4-1 Main scan direction MTF modification

Fig.93 shows the block diagram of the main scan direction MTF modifier and Fig.94 its timings.

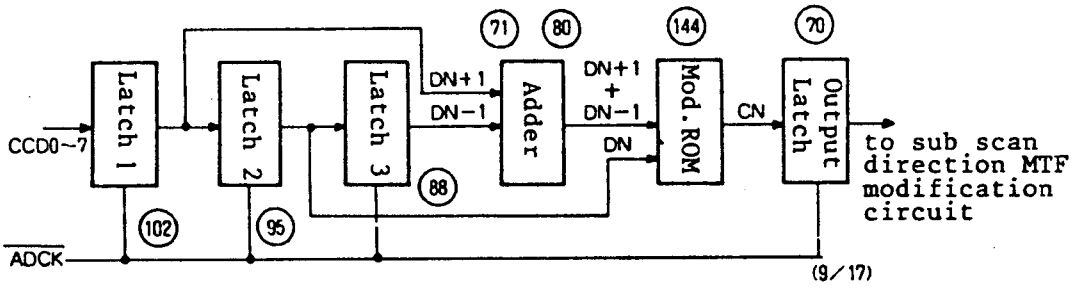


Fig.93 Main scan MTF modifier block diagram

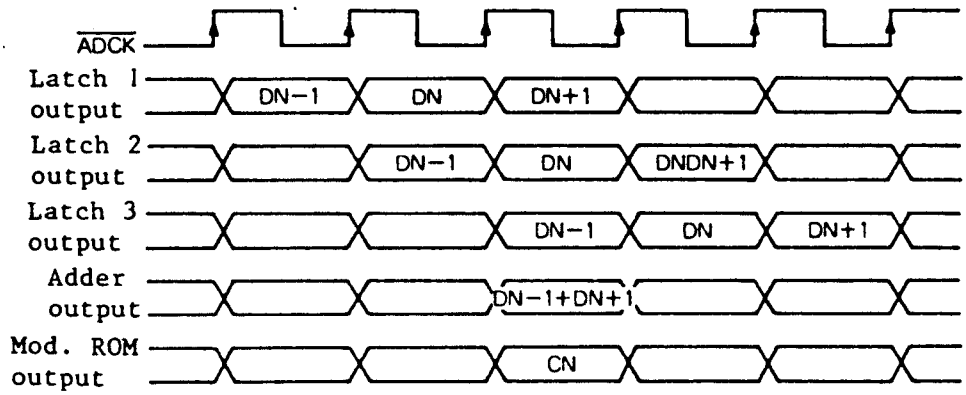


Fig.94 Main scan MTF modification timings

The A/D converted data, CCD 0 thru 7, are delayed by three stages of latches, 1 thru 3, and, the attention pixel DN and its adjoining pixels, DN-1 and DN+1, are sent out at the same time. Here, the sum of the adjoining pixels are obtained by the adder. And, the main scan direction MTF modified data CN are produced on the basis of its result and attention pixel DN, via the correction ROM in which contained the data for the MTF modification.

8-4-2 Sub-scan direction MTF modification

Fig.95 shows the block diagram of the sub-scan direction MTF modifier and Fig.96 its timings.

The data output from the main scan direction MTF modifier are written in the line memory through the line adder. The line memory output is transferred to the latch-1 at a low high transition of $\overline{\text{LMRD}}$. Then, the latch-1 becomes output enabled with a high state of $\overline{\text{LMRD}}$. Similarly, the sub-line memory-1 and sub-line memory-2 outputs are transferred to the latch-2 and the latch-3, respectively. When output is enabled, the attention pixel DM and its adjoining pixels, DM-1 and DM+1, are sent out at the same time. Here, the sum of the adjoining pixels, DM-1 and DM+1, is obtained through the adder, and its result is stored in the latch-4. Meanwhile, the sub-scan direction MTF modified data CM is obtained on the basis of the sum of the adjoining pixels, DM-1 and DM+1A, and the attention pixel DM via the correction ROM in which contained the data for the MTF modification, for, the attention pixel moves to the latch-5.

When the latch-1 output is enabled, the data in the line memory are written in the same address of the sub-line memory-1 with $\overline{\text{LMWR2}}$. Similarly, the data in the sub-line memory-1 are written in the same address of the sub-line memory-2, to shift the line data.

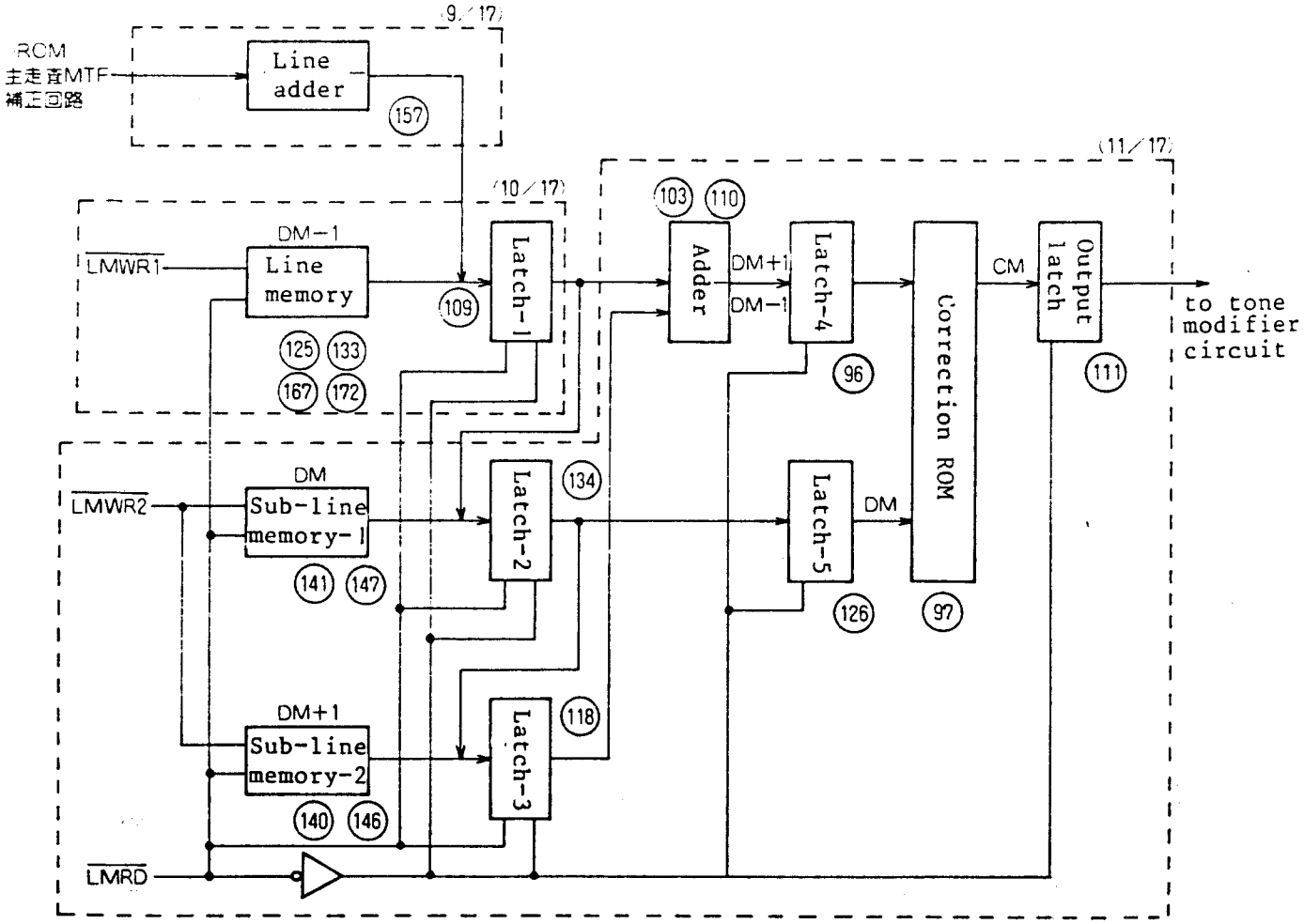


Fig.95 Sub-scan MTF modifier block diagram

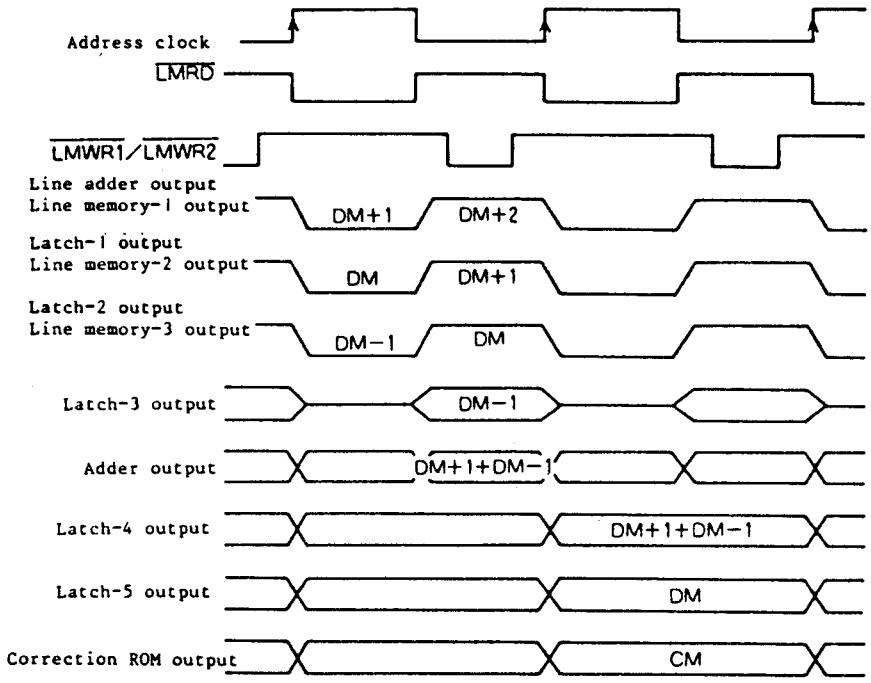


Fig.96 Sub-scan MTF modify timings

8-5 Tone modifier

The CS CNT circuit diagram 12/17 corresponds to the tone modifier.
In the tone modifier, the scan data output is modified for red, green, and red, respectively. A RAM is used for the correction memory (IC62) and it can be accessed from either the CPU and hardware.
The output data from the MTF modifier are sent to the correction memory and tone corrected in reference to the data already stored by the CPU and sent out of the memory. The data are then latched in the parallel latch (IC83) in the halftone scan mode, to be stored in the buffer memory. In the case of the binary mode, the data are latched in the serial latch (IC74). After latching data of eight pixels, they are stored in the buffer memory to be subjected to the tone correction.
Since a RAM is used for the correction memory, the correction data can be revised from the external side.

8-6 Buffer memory

The CS CNT circuit diagrams 13/17 and 14/17 correspond to the buffer memory.
It consists of the following two blocks:

(1) Buffer memory-1...CS CNT 13/17
(2) Buffer memory-2...CS CNT 14/17

When CHBM issued from the memory control I/O (IC178) is at a high level, the buffer memory-1 (IC49, 56) is under hardware control, into which stored the output data from the tone modifier. In this moment, the buffer memory-2 (IC8, 15) is under the control of the CPU and the data are transferred on the GPIBC by the CPU or the DMAC.
When the data have been completed to store in the buffer memory-1 and that data transfer has been complete from the buffer memory, CHBM changes from high to low level and the operation opposite to the above is carried out.
After repeating the above operation for a period of one scan time, the scan data are sent out on the GPIB.

8-7 GPIB interface

The CS CNT circuit diagram 17/17 corresponds to the GPIB interface.
The data from the scanner are sent to the external device via the GPIB interface.
The TMS9914A is employed for the GPIB adapter (IC26) for the control of GPIB interface. Device function is controlled by the CPU via the GPIB adapter.
As $\overline{\text{ACCRQ}}$ and $\overline{\text{ACCGR}}$ are connected to DRQ0 to DRQ2 of the DMAC (IC111), it handles data transmit request from the GPIB.
$\overline{\text{INT}}$ is connected to the $\overline{\text{INT}}$ line of the CPU (IC161), it handles IFC, DCL, and data read request.
Electrical specification of the TMS9914A and GPIB description are attached to this text.

8-7. GPIB interface

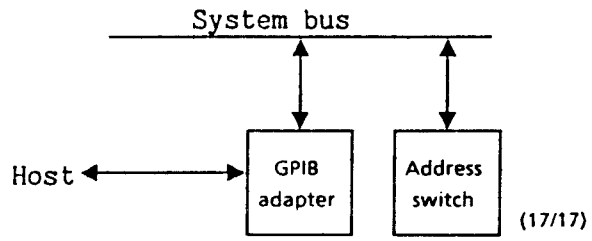


Fig.98

The GPIB interface sends the scanner read data on the GPIB interface bus to be supplied to external devices. TMS9914A is adopted as GPIB adapter (IC16) to process GPIB interface function.The device function is processed by the CPU via the GPIB adapter.-ACCRQ and -ACCGR of GPIB adapter are connected with DRQ0~2 of DMAC(IC171) and -DACK0~3 to respond to a data transmit request from the GPIB adapter. Further, -INT is connected with -INT line of the CPU (IC161) to respond to IFC, DCL, and data scan requests.

8-7-1. GPIB outline

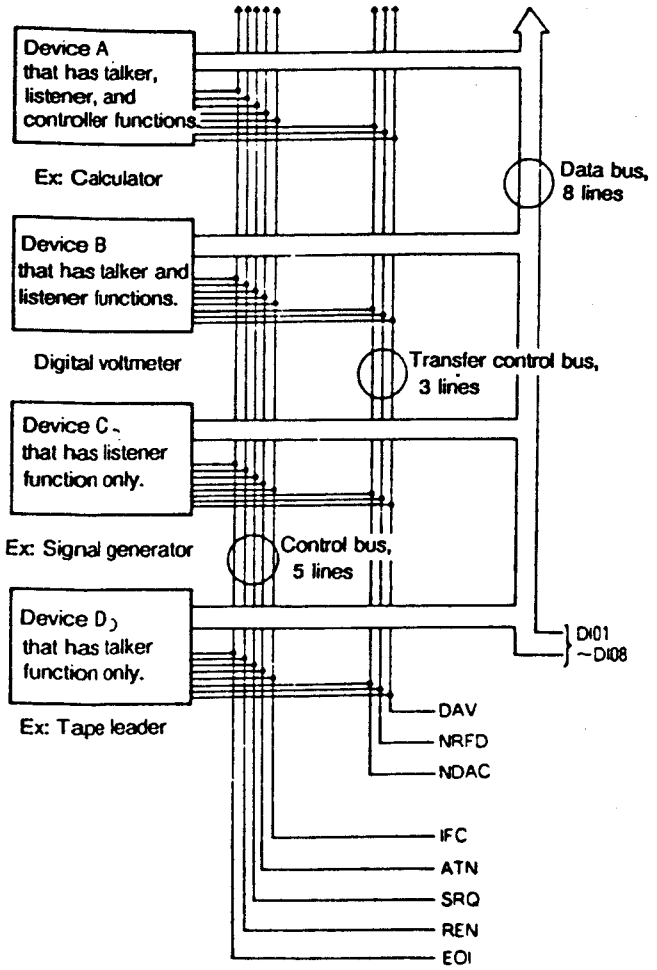


Fig.99. Interface function and configuration

This interface bus consists of 16 signal lines. These signal lines are connected with devices in conformance to IEEE-488 and information exchange is carried out via the cable.One bus can be connected with 15 devices at a maximum, and device connection is achieved by handshaking through three signal lines, which permits transfer between devices under different baud rates.

Sixteen interface buses consist of the following:
Data bus: 8 lines (D101~D108)
Transfer control bus: 3 lines (DAV, NRFD, NDAC)
Control bus: 5 lines (IFC, ATN, SRQ, FEN, ECI)

Fig.100 shows the basic timing of GPIB. When IFC (interface clear) is sent from the controller, all the devices on GPIB are reset. Next, when ATN (attention) goes low, the controller becomes ready for sending commands. Talker address and listener address are assigned after resetting all the listeners by UNL (UNLISTEN). Data transfer will start from talker to listener with a high state of ATN. A low state of DAV (data valid) indicates that the data is valid when a command or data is being sent. EOI is a signal to indicate termination of data transfer.

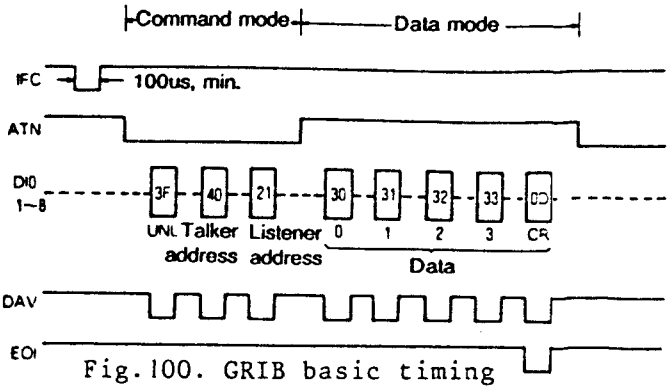


Fig.100. GRIB basic timing

8-7-2. 3-line handshake

Figs.101 and 102 show handshake timing and process flow of 3-line handshake system. Assume now that a talker is sending data to the listener. The talker sends signals on D101~8 and DAV. The listener responds with NRFD (Not Ready For Data) and NDAC(Not Data Accepted).

If NRFD is at a high when the talker has prepared for D101~D108, which means that the listener is ready for receiving data, the talker informs the listener by setting DAV low that data is valid. Responding to this, the listener starts receiving the data. After completion of receiving the data, the listener informs the talker of the completion of receiving data by forcing NDAC high. Responding to this, the talker sets DAV high and starts preparation for a next data.

Since listeners may be plural while the talker is only one on the same GPIB, devices are OR wired because the NRFD and NDAC lines are of open collector type.
Accordingly, GPIB will always operate after receiving a response from the device that operates the latest.On GPIB, all the operations are always controlled under the 3-line handshake system.

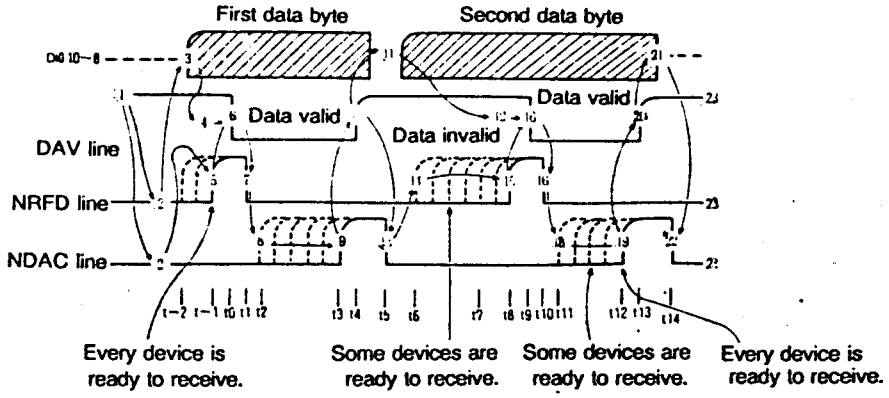


Fig.101. 3-line handshake timing chart

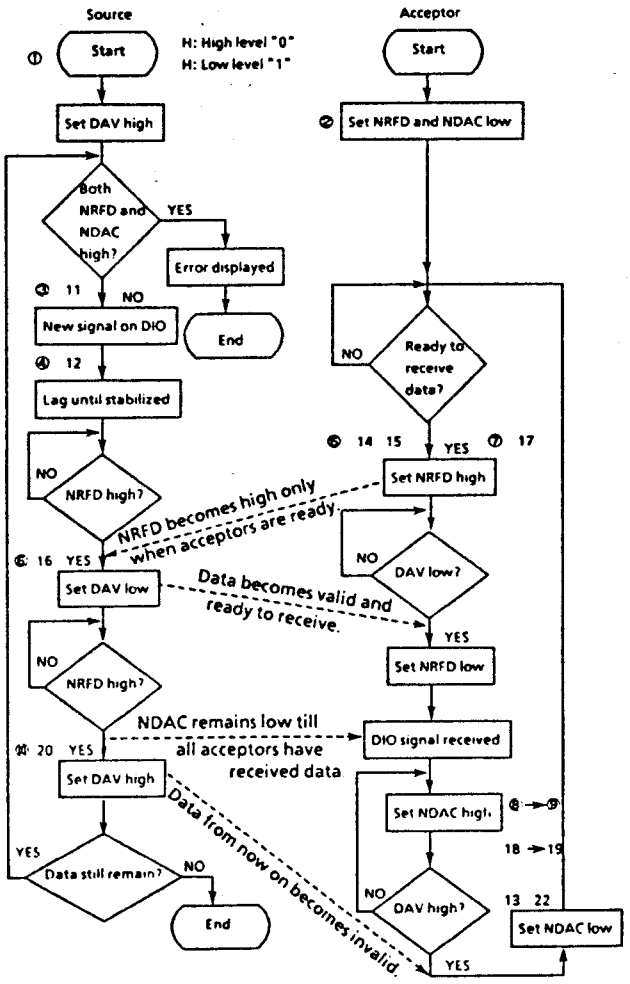


Fig.102. 3-line handshake flow

8-7-3. General specification

(1) Total cable length :20 m, max.
(2) Cable length between device :5 m, max.
(3) Maximum devices connected devices :15
(4) Data transfer mode :3-line handshake
(5) Data transfer speed :1 M byte/sec. at maximum
(6) Data transfer method :8 b parallel
(7) Kind and number of signal lines:
Data line (D101~D108): 8 lines, bi-directional
Control line: 8 lines, both directional, handshake lines (DAV, NRFD, NDAC)
Control lines: (ATN, REN, IFC,
SRC, ECI) signal/system grand 8 lines
(8)Signal logic :negative logic
True L level (0.8 V or below)
False H level (2.0 V or above)
(9) Interface connector

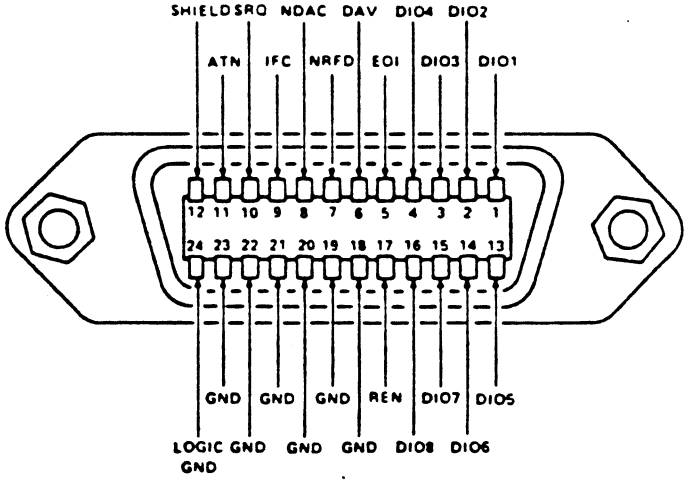
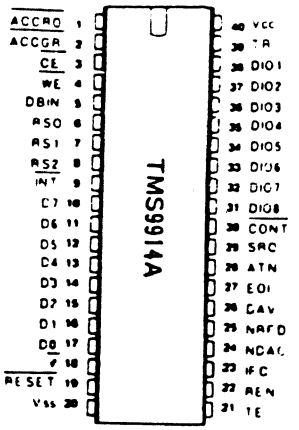

SHIELD SRQ NDAC DAV DIO4 DIO2
ATN IFC NRFD EOI DIO3 DIO1
12 11 10 9 8 7 6 5 4 3 2 1
24 23 22 21 20 19 18 17 16 15 14 13
GND GND GND REN DIO7 DIO5
LOGIC GND GND GND GND DIO8 DIO6
GND

Fig.103.

8-7-4. Signal functions

Bus signal lines		Remark	
Data /bus	DIO1(Data input/Output 1) DIO2(Data input/Output 2) DIO3(Data input/Output 3) DIO4(Data input/Output 4) DIO5(Data input/Output 5) DIO6(Data input/Output 6) DIO7(Data input/Output 7) DIO8(Data input/Output 8)	Data transfer <Example> Address Command Measured data Program data Display data Status	
Transfer bus	DAV(Data Valid) NRFD(Not Ready For Data) NDAC(Not Data Accepted)	Signal indicating data validity Signal for ready to receive Signal for completion of receiving	Performs acceptance and source handshake
Control bus	ATN(Attention) IFC(Interface Clear) SRQ(Service Request) REN(Remote Enable) EOI(End or Identify)	Signal indicating that data on data bus is address or a command Signal to reset interface Signal request ing sevice Remote/local signal Signal indicating last byte or execution of parallel poll.	

Signal name	Pin No	In/Out (TYPE)	Function
DIO8(MSB)	31	I/O(p/p)	D101~8 are data input lines for GPIB, connected with GPIB
DIO7	32	I/O(p/p)	
DIO6	33	I/O(p/p)	
DIO5	34	I/O(p/p)	
DIO4	35	I/O(p/p)	
DIO3	36	I/O(p/p)	
DIO2	37	I/O(p/p)	
DIO1	38	I/O(p/p)	
DAV	26	I/O(p/p)	DATA VALID: Source informs acceptor by setting handshake line low that valid data is coming out or in through non-inverting transceiver.
NDAC	24	I/O(p/p)	NOT DATA ACCEPTED: Acceptor informs source by setting handshake line high that D10 bus data has been latched.
NRFD	25	I/O(p/p)	NOT READY FOR DATA: Acceptor informs source by setting handshake line high that the following data has been ready to receive.
ATN	28	I/O(p/p)	ATTENTION: This signal is sent from controller. A low state of this signal represents an interface message and high state transmission of data on the DIO bus.
REN	22	I/O(p/p)	REMOTE ENABLE: This signal is sent from system controller for selection of device control, remote or on front panel.
IFC	23	I/O(p/p)	INTERFACE CLEAR: This signal is sent from system controller to set devices in a known stable condition.
SRQ	29	I/O(p/p)	SERVICE REQUEST: This signal is sent from other than controller to request service from controller.
EOI	27	I/O(p/p)	END OR IDENTIFY: When ATN is high, this signal indicates the end of a data block. When ATN is at low, this signal indicates that the controller is executing p[parallel poll.
$\overline{\text{CONT}}$	30	I/O(p/p)	Determines in/out direction of bus control transceiver, may be expressed by logic formula (DIDS+CADS).
TE	21	I/O(p/p)	TALK ENABLE: Determines in/out direction of transceiver for D10 and handshake line, may be expressed by [CACS+TACS+SPAS+FO1•ATN(CIDS+CADS), swrst]



(Note) (p/p)= Push-pull output,
(o/d)= Open drain output with pullup

Signal name	Pin No	In/Out (TYPE)	Function
DO(MSB)	17	I/O(p/p)	Data transfer line on microprocessor side
D1	16	I/O(p/p)	
D2	15	I/O(p/p)	
D3	14	I/O(p/p)	
D4	13	I/O(p/p)	
D5	12	I/O(p/p)	
D6	11	I/O(p/p)	
D7(LSB)	10	I/O(p/p)	
RS0	6	I	REGISTER SELECT LINES: Address input for microprocessor to select internal register.
RS1	7	I	
RS2	8	I	
$\overline{CE}$	3	I	CHIP ENABLE: With a low state of this signal, the internal register can be accessed.
$\overline{WE}$	4	I	WRITE ENABLE: With a low state of this signal, data can be written into one of internal registers.
DBIN	5	I	DATA BUS IN: With a high state of this signal, data can be read from one of internal registers.
$\overline{INT}$	9	O(o/d) (no pull-up)	INTERRUPT: Interrupt request output to microprocessor
$\overline{ACCRQ}$	1	O(p/p)	ACCESS REQUEST: DMA (Direct Memory Access) request output
$\overline{ACCGR}$	2	I	ACCESS GRANTED: Respond input to DMAC(Direct Memory Access Controller) to -ACCRQ. Connected with +5V when DMAC is not used.
$\overline{RESET}$*	19	I	RESET: Hardware reset input, which causes TMS9914 idle.
TR	39	O(p/p)	TRIGGER: Pulse sent out when GET command has been received from GPIB or when microprocessor has executed the fget command.
$\overline{\phi}$	18	I	CLOCK: 500KHz to 5MHz. Synchronization with microprocessor is not required.
$\overline{Vss}$	20		0V Ground
$\overline{Vcc}$	40		+5V

(Note) (p/p)= Push-pull output,
(o/d)= Open drain output with pullup
* RESET has the following effects on TMS9914A.
- Serial/parallel port cleared.
- All c/s type commands are cleared except "swrst".
- 'swrst' command is set; thereby TMS9914A goes idle.

9. Power supply

Block diagram

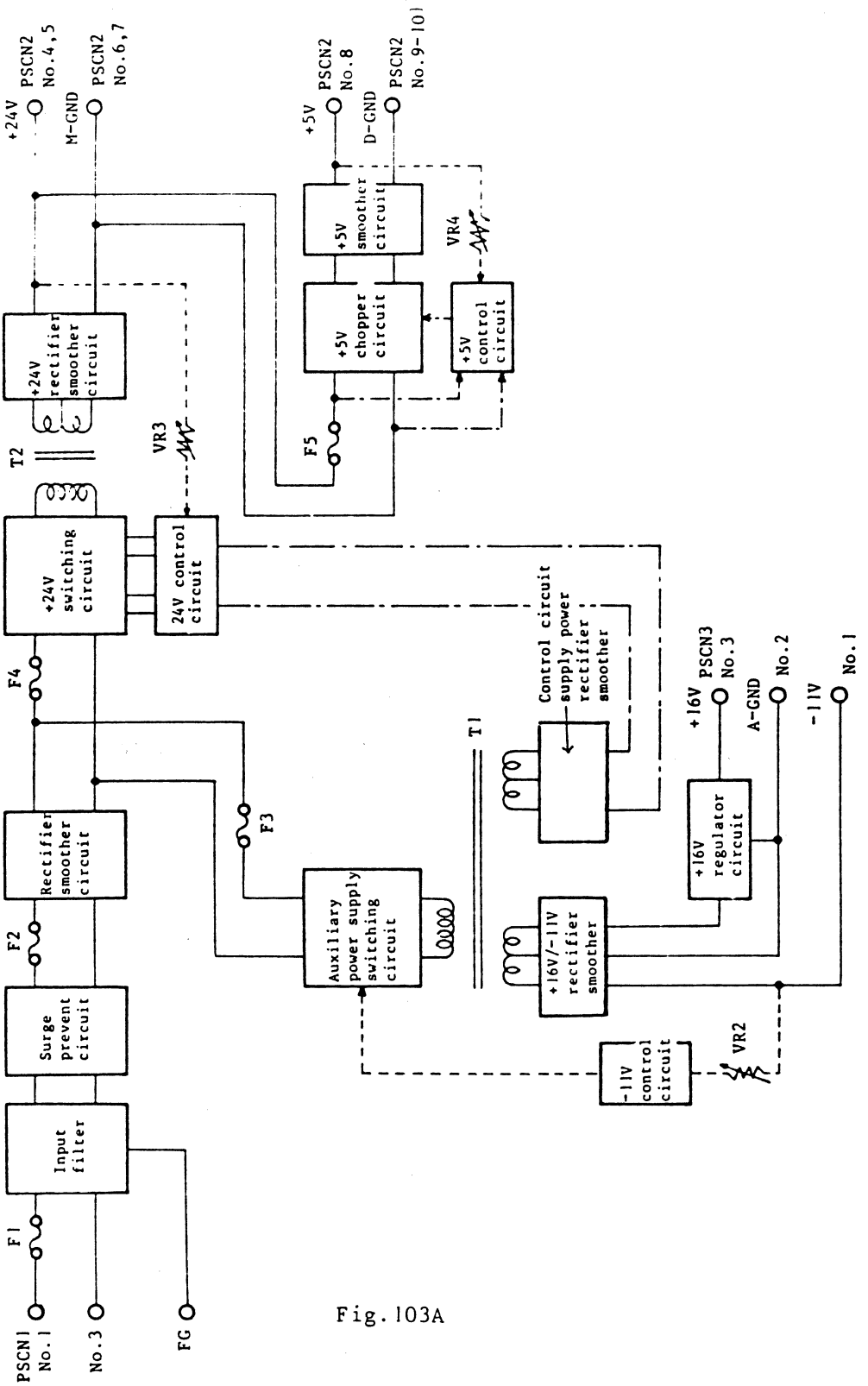


Fig. 103A

Source input of 85 to 135V is transformed into four outputs of +16V, 0.45A, -11V, 0.25A, +5V, 3.5A, and +24V, 3A.
The output +24V is produced via the half bridge, +5V via the chopper type DC-DC converter, and +16V and -11V via the ringing choke converter.

The following describes about the action of each block:

9-1 Input section

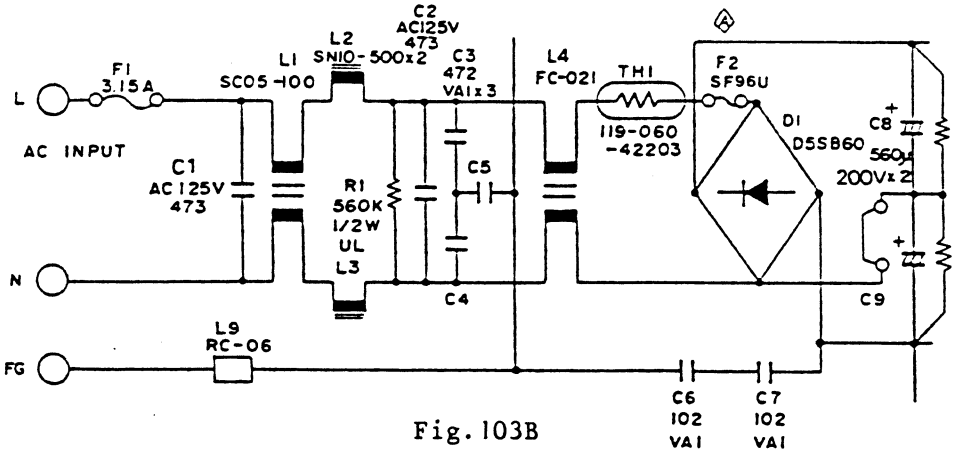


Fig. 103B

(Input filter)

This block consists of the filter chokes, L1 thru L4, L9, capacitors, C1 thru C4, C6, and C7, which are used to eliminate noise from the power supply.

(Surge prevent circuit)

The thermistor TH1 is used in this circuit to prevent a large surge at power on.
Though the resistance of the thermistor is about 6Ω immediately after power on, it will drop to 1Ω or less due to heating of the thermistor itself so that it restrict and prevents flowing of an excessive current immediately after power on because of the initial resistance.

(Rectifier and smmother circuits)

The source AC input voltage is double voltage rectified in the diode D1 and smoothed in the electrolytic capacitors, C8 and C9.

9-2 Auxiliary switching circuit

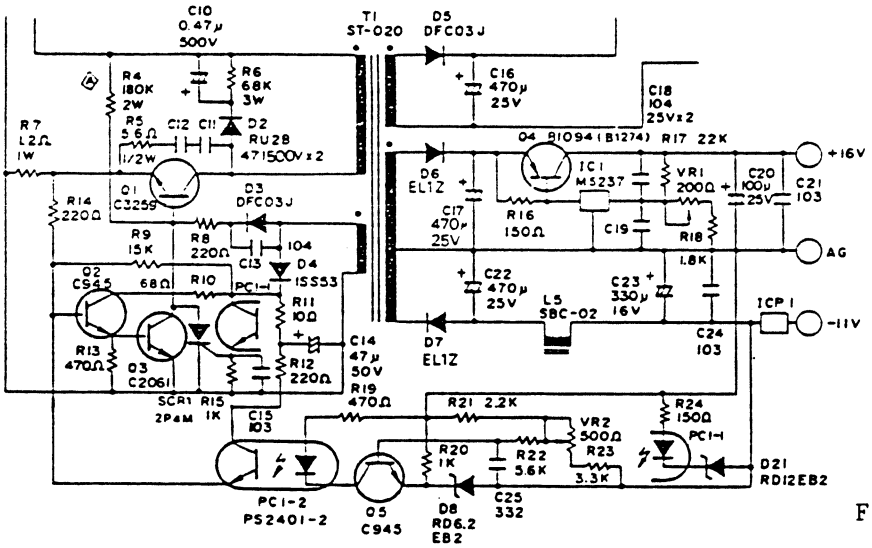


Fig. 104

It comprises the ringing choking converter switching power supply. By alternately operating the transistor Q1 on and off, the dc component of the input is converted into high frequency pulse which is dropped by the insulated transformer T1 to produce +16V, -11V, and other supply through the rectifier and smoother circuit on the secondary circuit side.
The on/off cycle of the transistor Q1 is controlled by the -11V control circuit.

9-3 +16V, -11V output circuit (Fig. 104)

To obtain the +16V supply, the secondary side output of the transformer T1 is rectified by the diode D6 and smoothed in the electrolytic capacitor C17 and regulated to +16V by the transistor Q4 and variable 3-line regulator IC1. It is possible to adjust the +16V output voltage using VR1.
To obtain the -11V supply, the diode D7, electrolytic capacitors, C22 and C23, and the choke coil L6 are used to rectify and smooth. The -11V supply is detected by the transistor Q5 and the zener diode D8 of the -11V control circuit. The detect signal is fed back to the control circuit that consists of transistors Q2 and Q3 which are isolated on the primary circuit side by the photocoupler PC1-1 and the on/off cycle of the transistor Q1 is controlled to regulate the -11V supply. It is possible to adjust the -11V supply using VR2.
The zener diode D21 and the thyristor SCR1 within the -11V control circuit are for overvoltage protection. When an overvoltage is added to the -11V circuit, the condition is detected by the zener diode D21 and the detect signal is added to the gate of the thyristor SCR1 on the primary side which is isolated by the photocoupler PC1-2, which drops the Q1 base signal to the ground level to stop oscillating the transistor Q2 to quit supplying.

9-4 Control circuit driving power supply (Fig.104)

The secondary circuit side output of the transformer T1 is rectified in the diode D5 and smoothed in the electrolytic capacitor C16 and supplied to the control circuit.

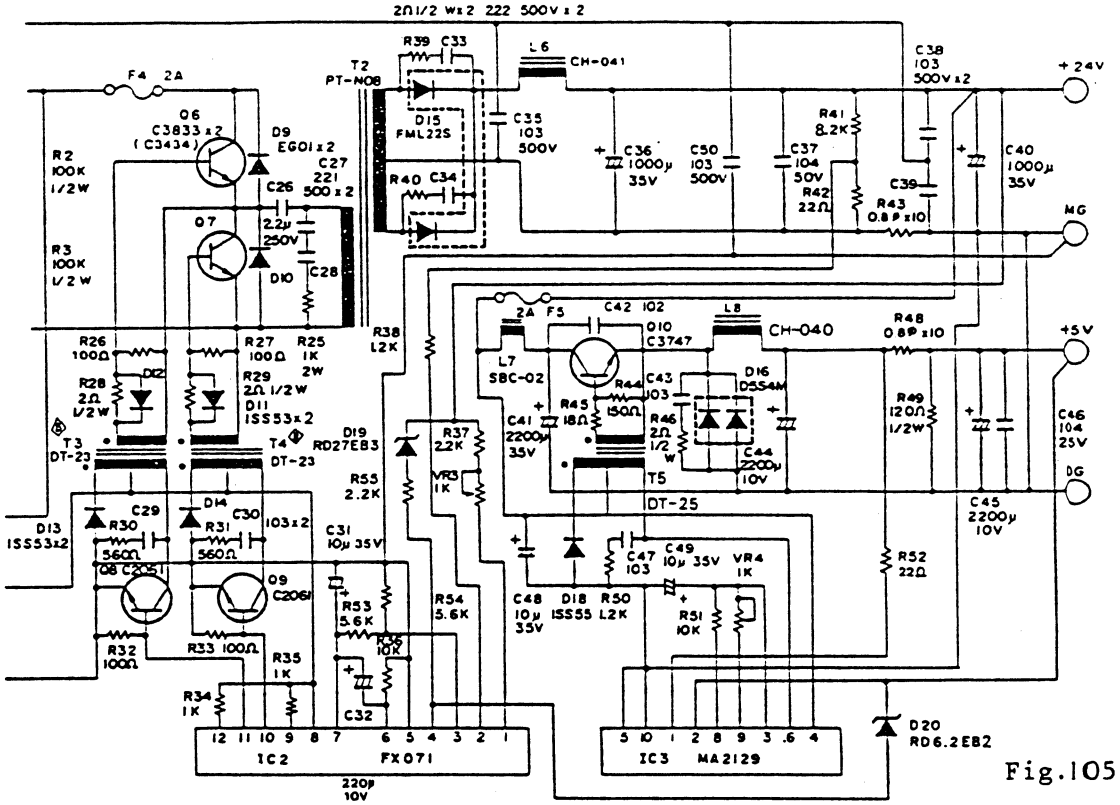


Fig.105

9-5 +24V circuit (Fig.105)

The +24V switching circuit employs the half bridge type. By alternately activating the transistors, Q6 and Q7, with the dc input using the signal from the control circuit, it converted into an ac square waveform of high frequency and dropped using the isolation transistor T2. And, rectified in the diode D15 of the rectifier circuit on the secondary circuit side, smoothed in the choke coil L6 and electrolytic capacitors, C36 and C40, to supply +24V.
The diodes, D9 and D10, capacitors, C27 and C28, and the resistor R25 comprises the snapper circuit to prevent noise generation and transistor destruction.

9-6 +24V control circuit (Fig.105)

The +24V supply is detected by the control IC IC2 and the control pulse is generated by driving the drive transistors, T3 and T4, and the pulse is added to the base of Q22 and Q23 on the primary circuit side which are isolated by the transformers, T3 and T4, to control the transistor on time to the given level to change the on-width of the oscillated pulse. It is possible to adjust the +24V output voltage using VR3.
Also, IC2 is employed to detect the output voltage using a manganese wire R43 which is used to decrease the oscillation pulse on-width when an overcurrent is found.

9-7 +5V circuit (Fig.105)

A chopper type dc-dc converter is used which is employed to convert it to high frequency pulse by turning the +24VDC supply on and off using the transistor Q10. And, it is smoothed by the choke coil L8 and electrolytic capacitors, C44 and C45, of the smoother circuit to obtain the +5V supply. The +5V output is detected by the control IC IC3 and the drive transistor T5 is driven using the equivalent control signal to generate the control pulse which is added to the base of the transistor Q10 to control the Q10 on time and the on-width of the oscillated pulse is changed to maintain the +5V to the given level.
In this manner, the +5V supply is kept in the given level under the PWM control mode. It is possible to adjust the +5V voltage using VR4.
Also, the manganese wire R48 is employed to detect the output current which will protect overcurrent by decreasing the oscillation pulse on-width when an overcurrent is met.

10 Lamp starter

The lamp starter consists of a 24VDC driven heater, red tube starter, green tube starter, and blue tube starter.
Fig.106 shows its block diagram.

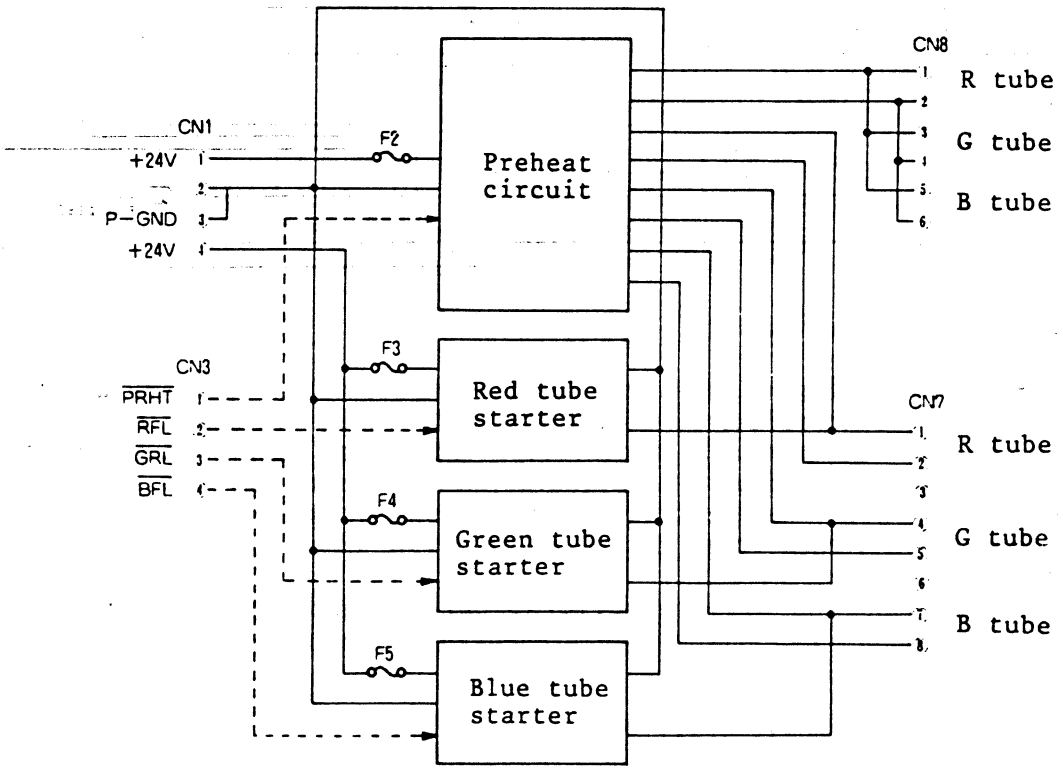


Fig.106 Starter blcok diagram

10-1 Preheat circuit

When $\overline{PRHT}$ of CN3 is at a low, the transistor Q1 is closed so that the oscillation circuit composed of the transistors, Q5 and Q6, and the transformer T1. In the oscillation circuit, Q5 and Q6 alternately turns on to convert the +24VDC supply into high frequency. After being dropped in T1, the signal is added to the filament of every fluorescent tube.

10-2 Red (green, blue) starter

When d $\overline{RFL}$ of CN3 is at a low, the transistor Q2 is closed so that the starter circuit composed of transistors, Q7 and Q8, and the transformer T2 start oscillating. In the oscillation circuit, Q7 and Q8 alternately turns on to convert the +24VDC supply into high frequency. After being dropped in T2, the signal is added to the red fluorescent tube to activate it.

10-3 Oscillation wave-form

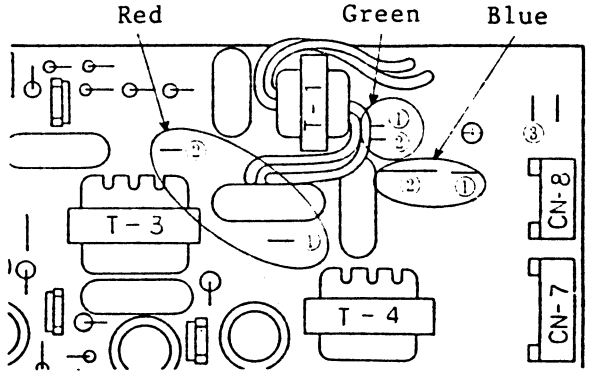


Fig.107

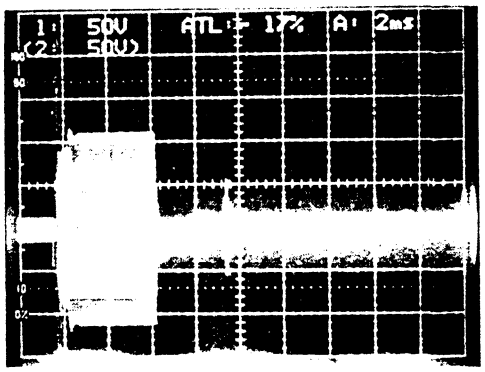


Fig.108 at a light-up 1

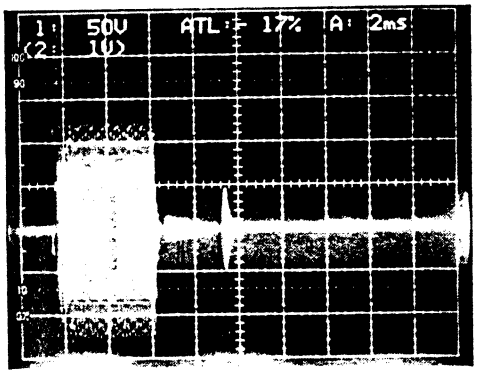


Fig.109 at a light-up 2

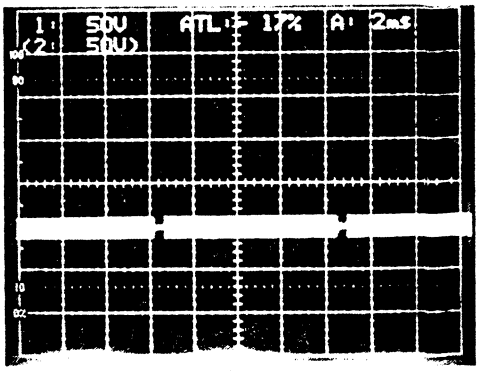
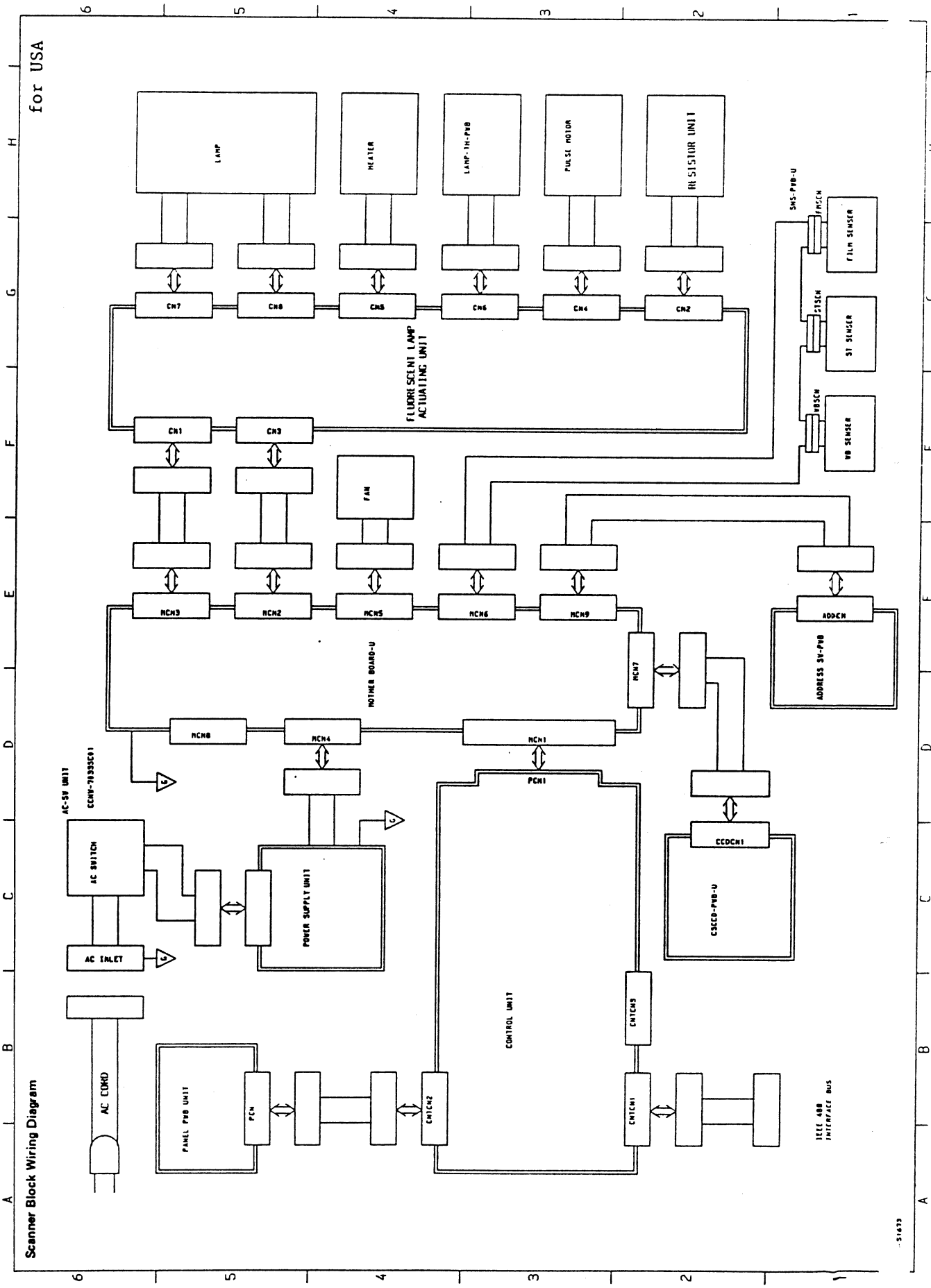
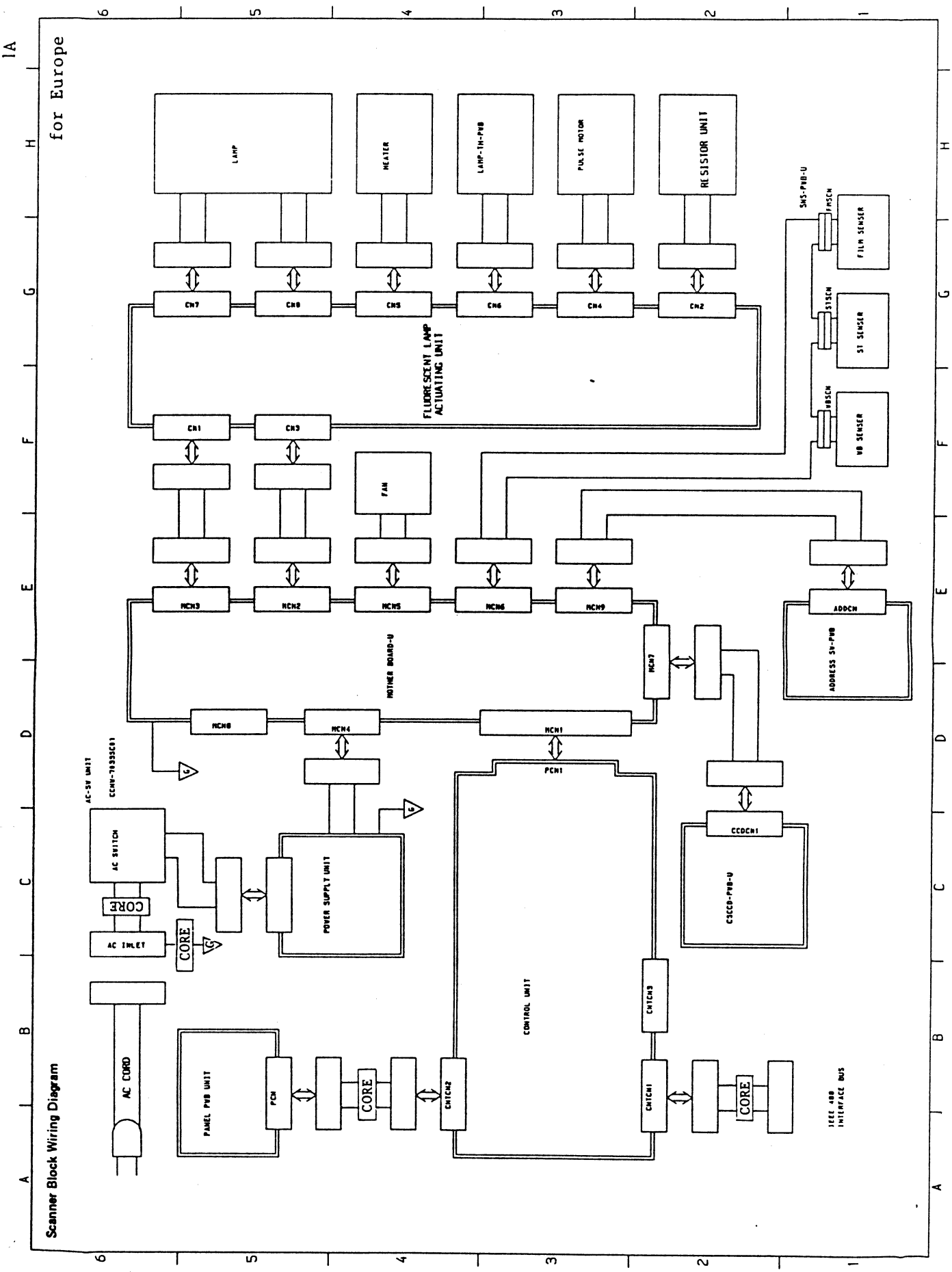


Fig.110 for heater 3

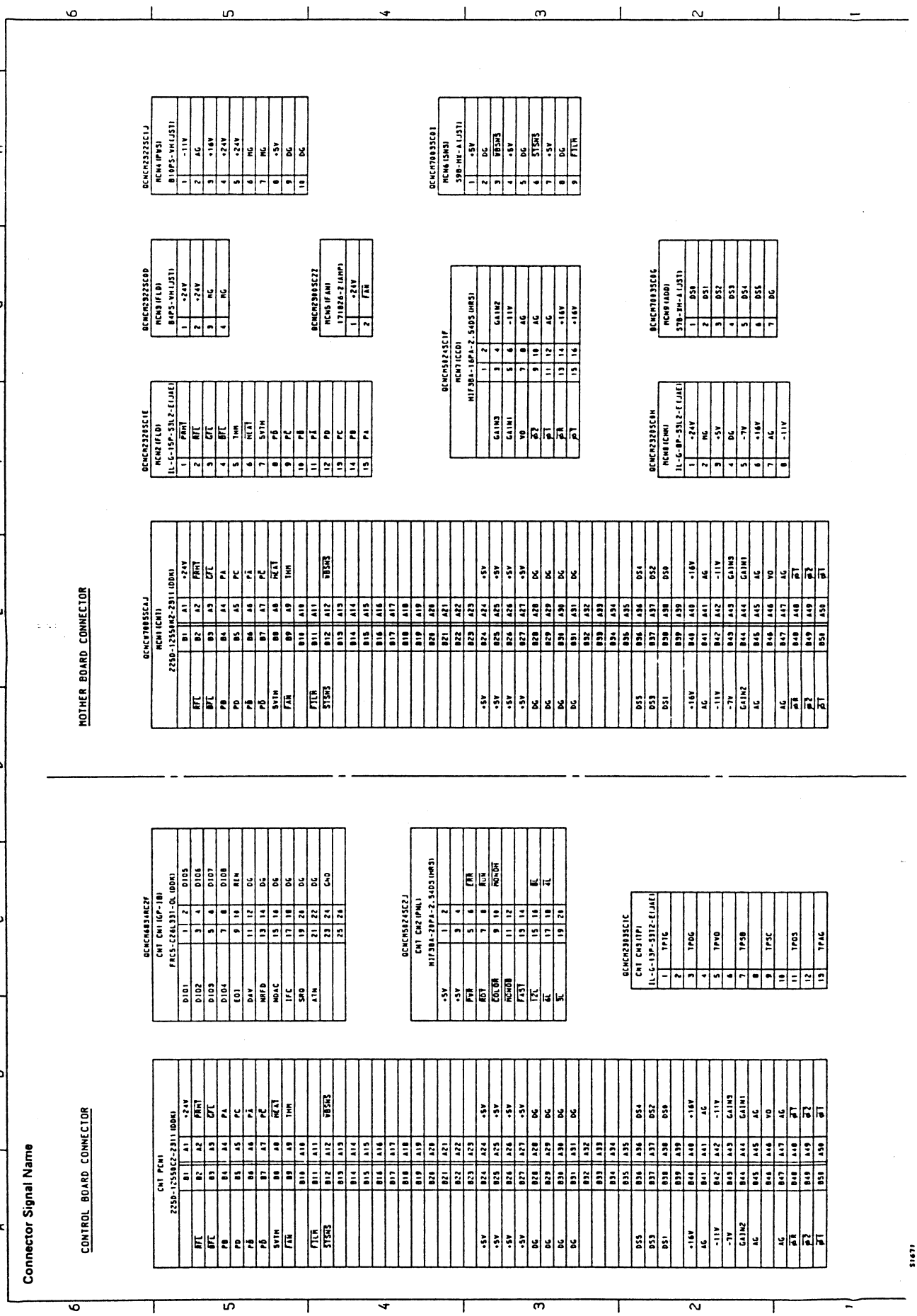
V CIRCUIT DIAGRAM

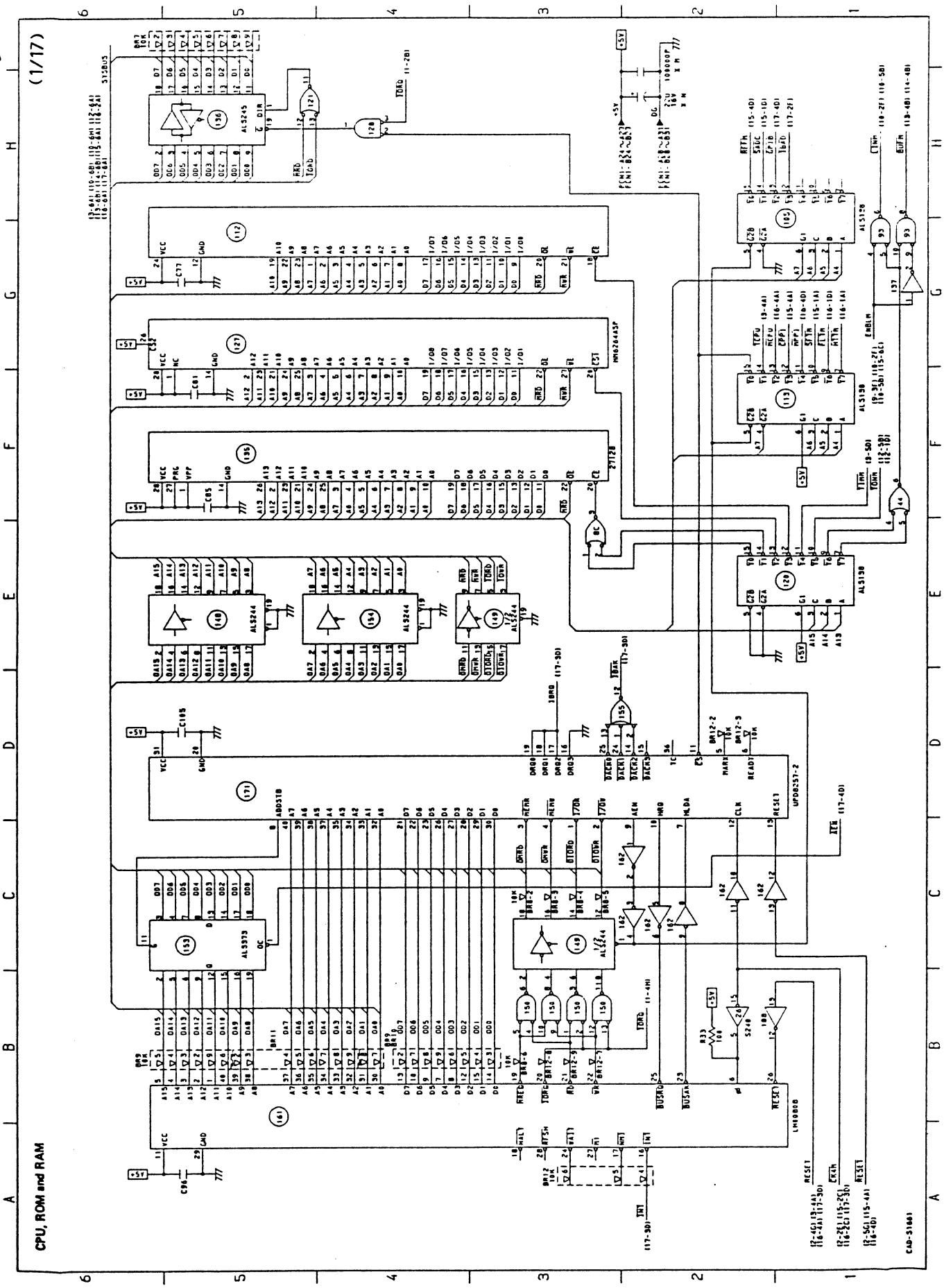
for USA

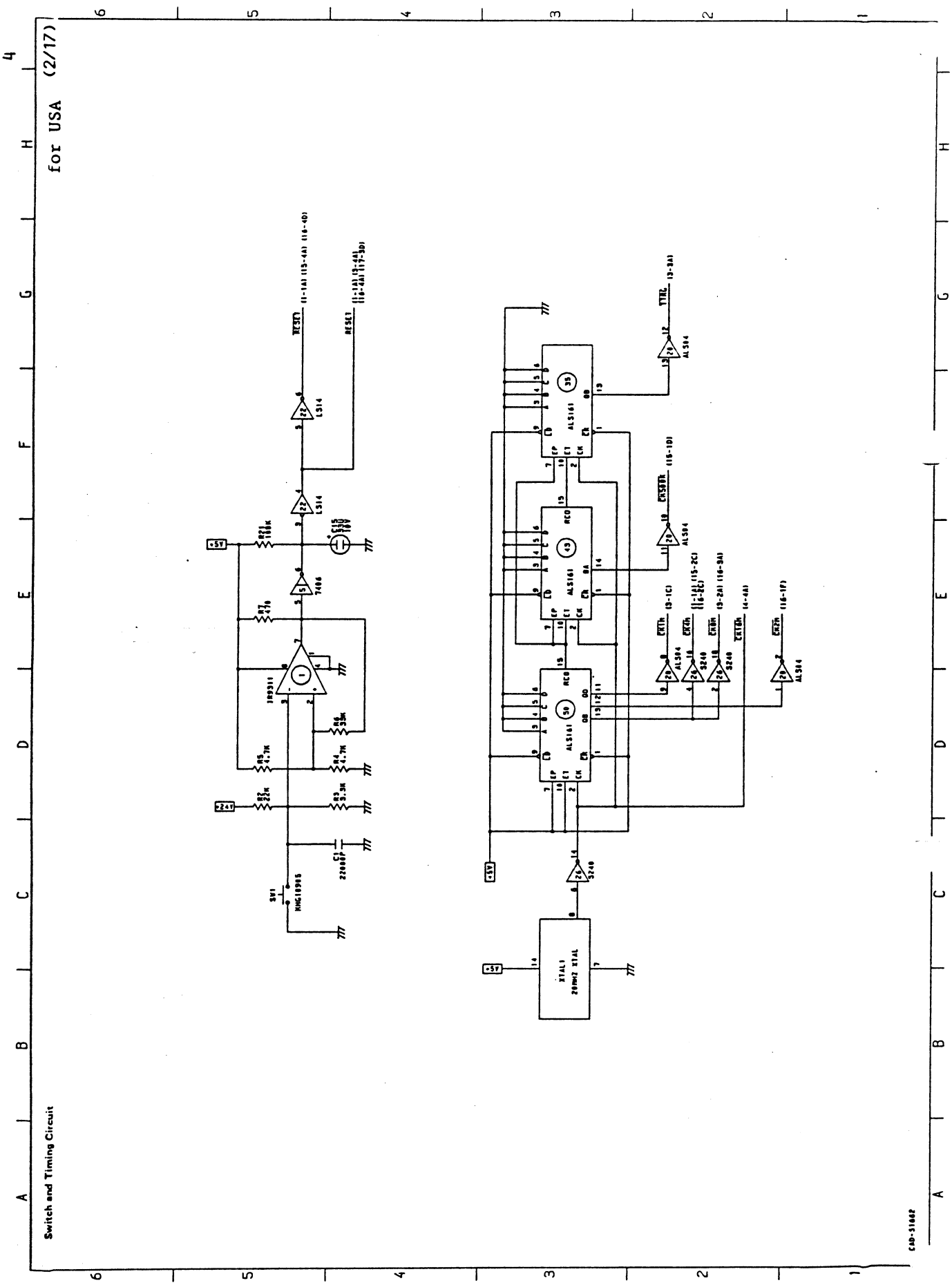


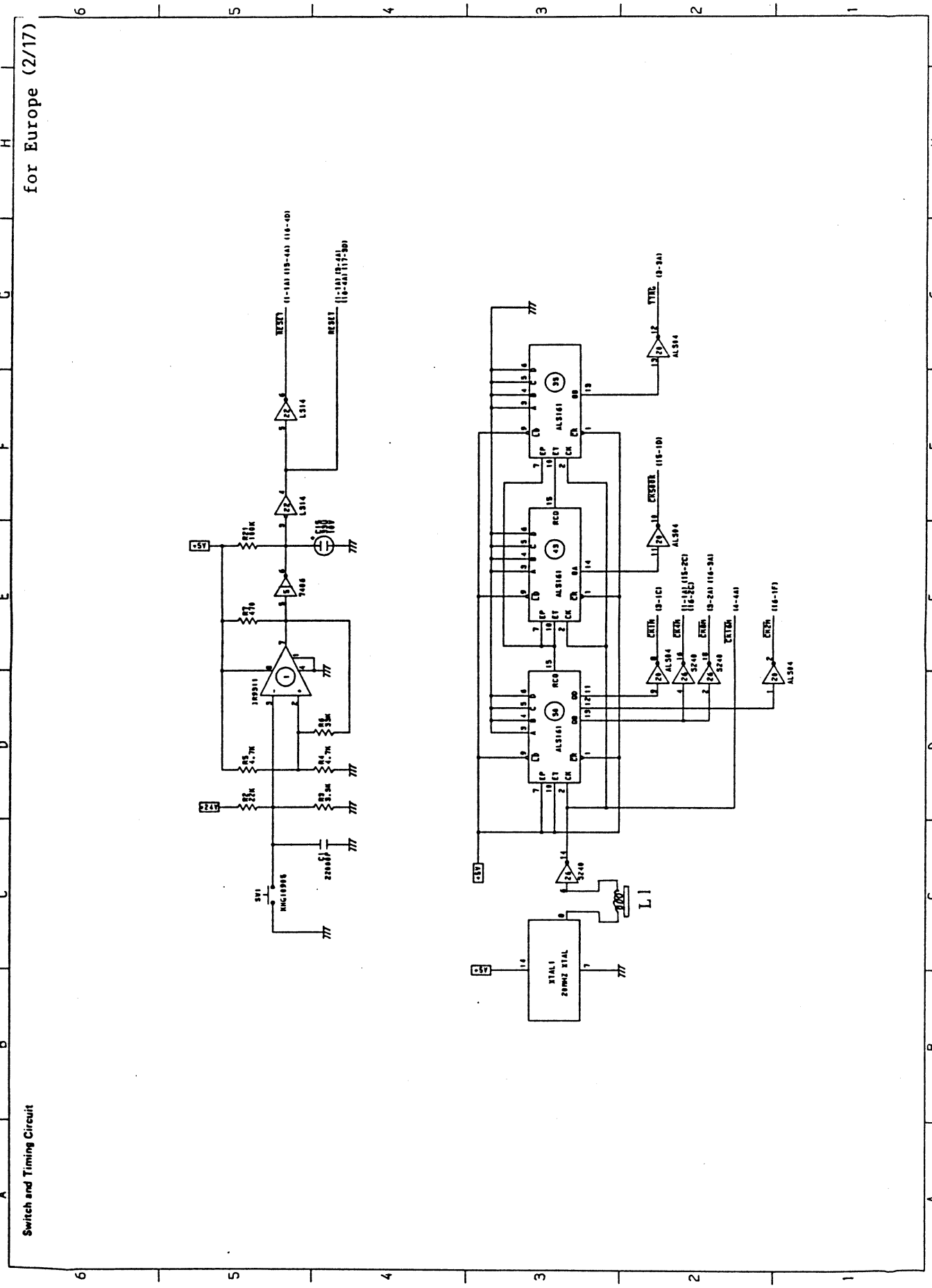

for Europe
Scanner Block Wiring Diagram
LAMP
HEATER
LAMP-IN-PWB
PULSE MOTOR
RESISTOR UNIT
FLUORESCENT LAMP ACTUATING UNIT
FILM SENSER
S1 SENSER
WB SENSER
SNS-PWB-U
FAN
MOTHER BOARD-U
ADDRESS SV-PWB
AC-SV UNIT
AC SWITCH
AC INLET
AC CORD
CORE
POWER SUPPLY UNIT
CONTROL UNIT
PANEL PWB UNIT
CSCCD-PWB-U
IEEE 488 INTERFACE BUS

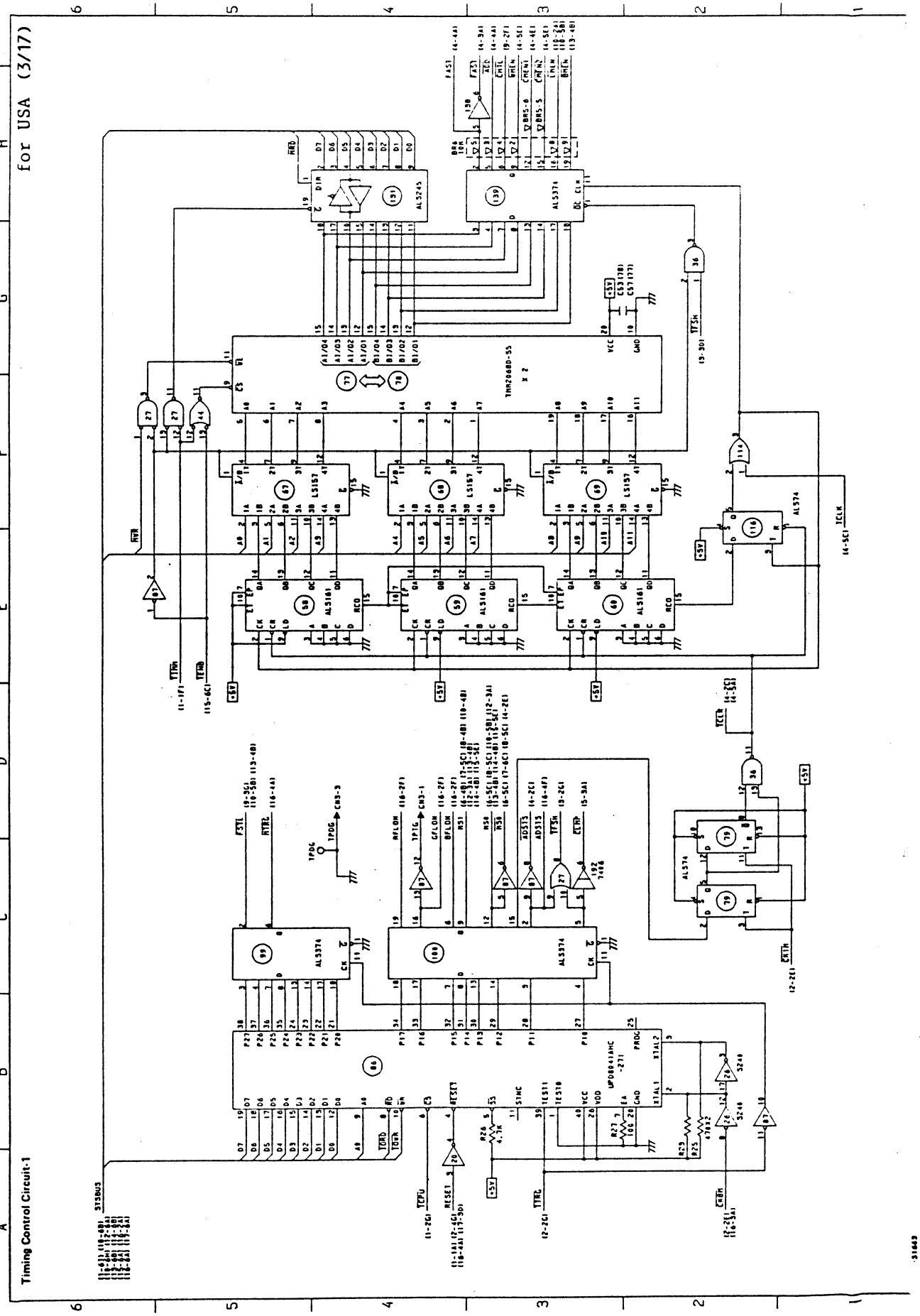
Connector Signal Name

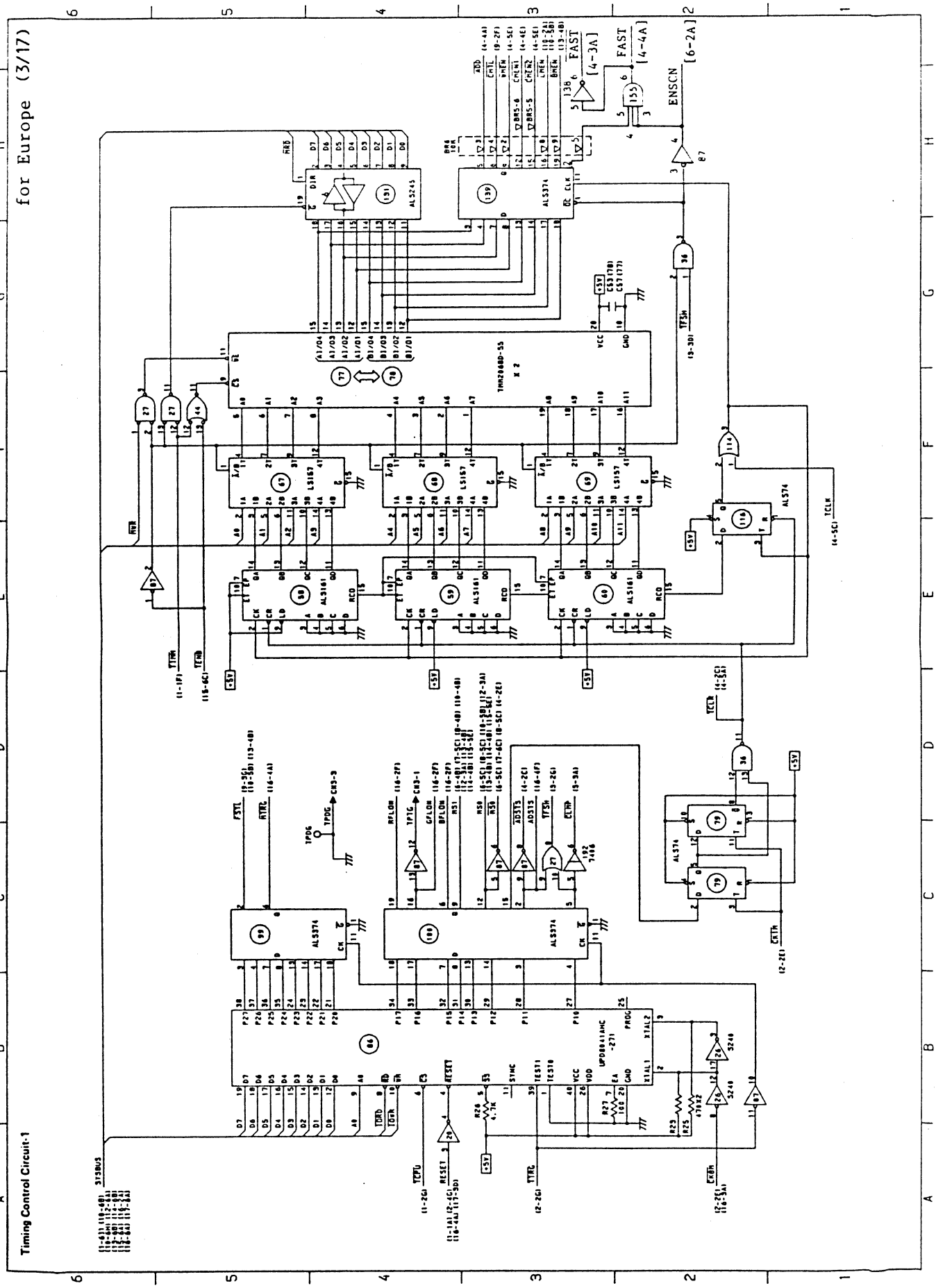


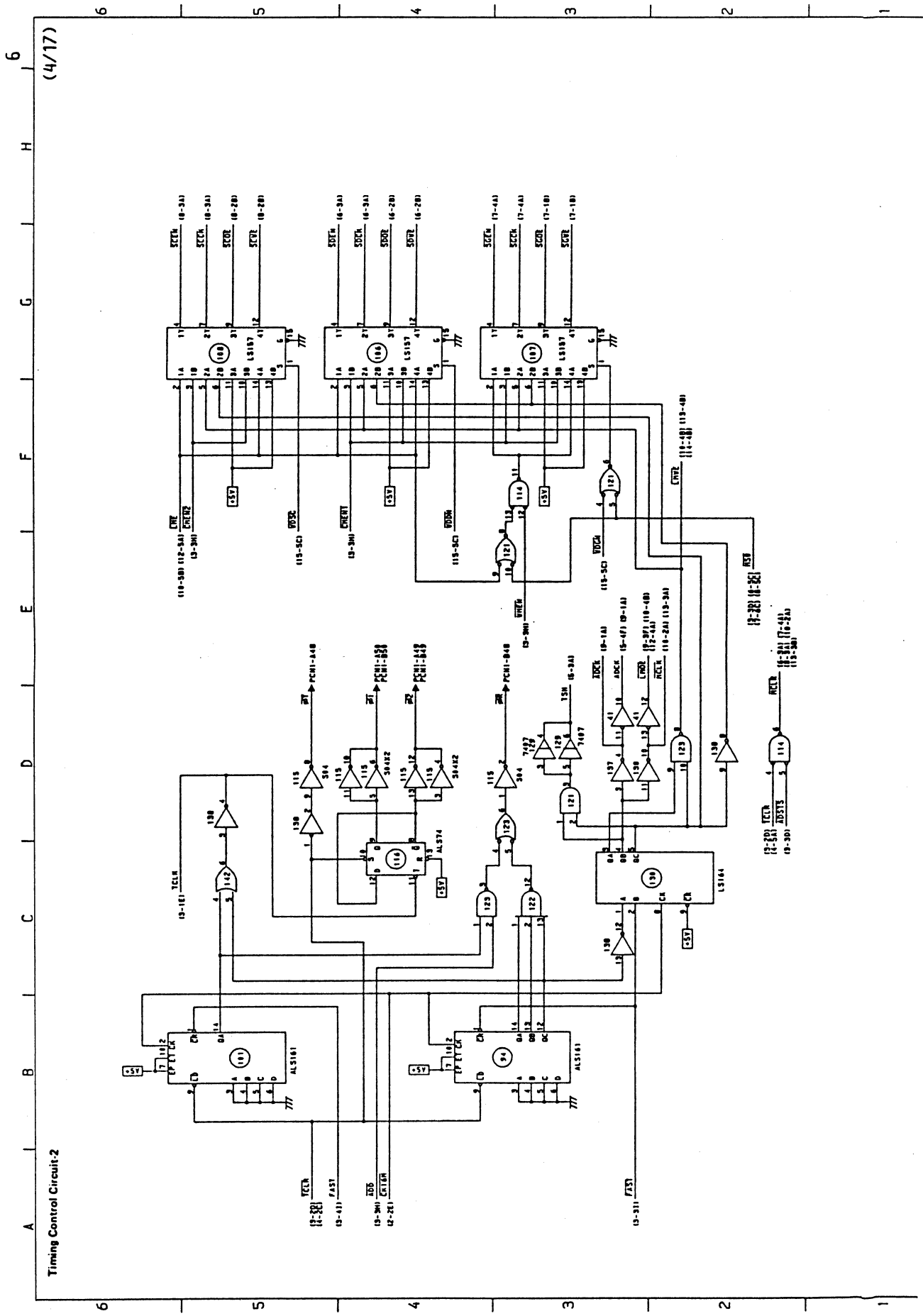

(1/17)
CPU, ROM and RAM

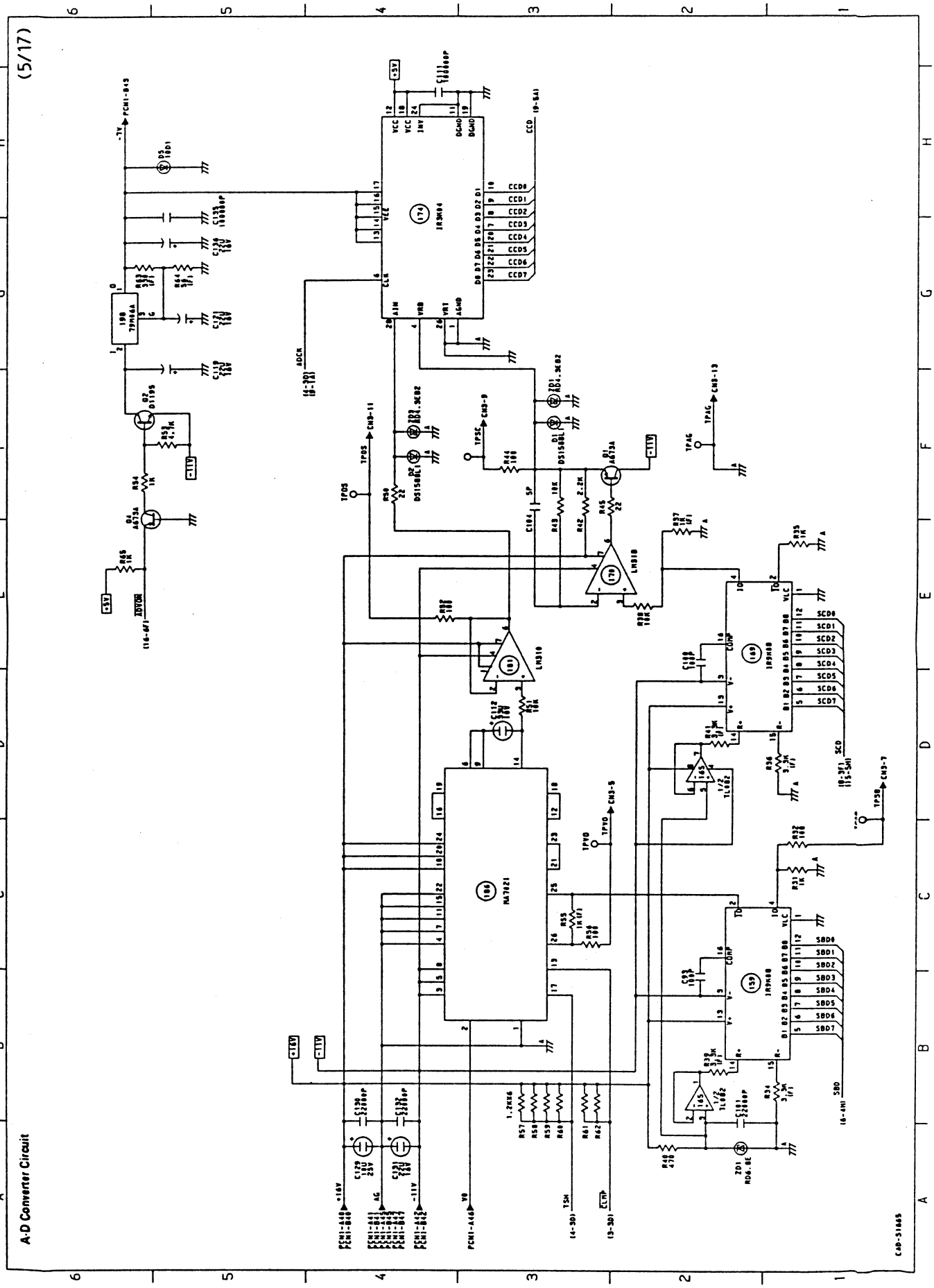

for USA (2/17)
Switch and Timing Circuit

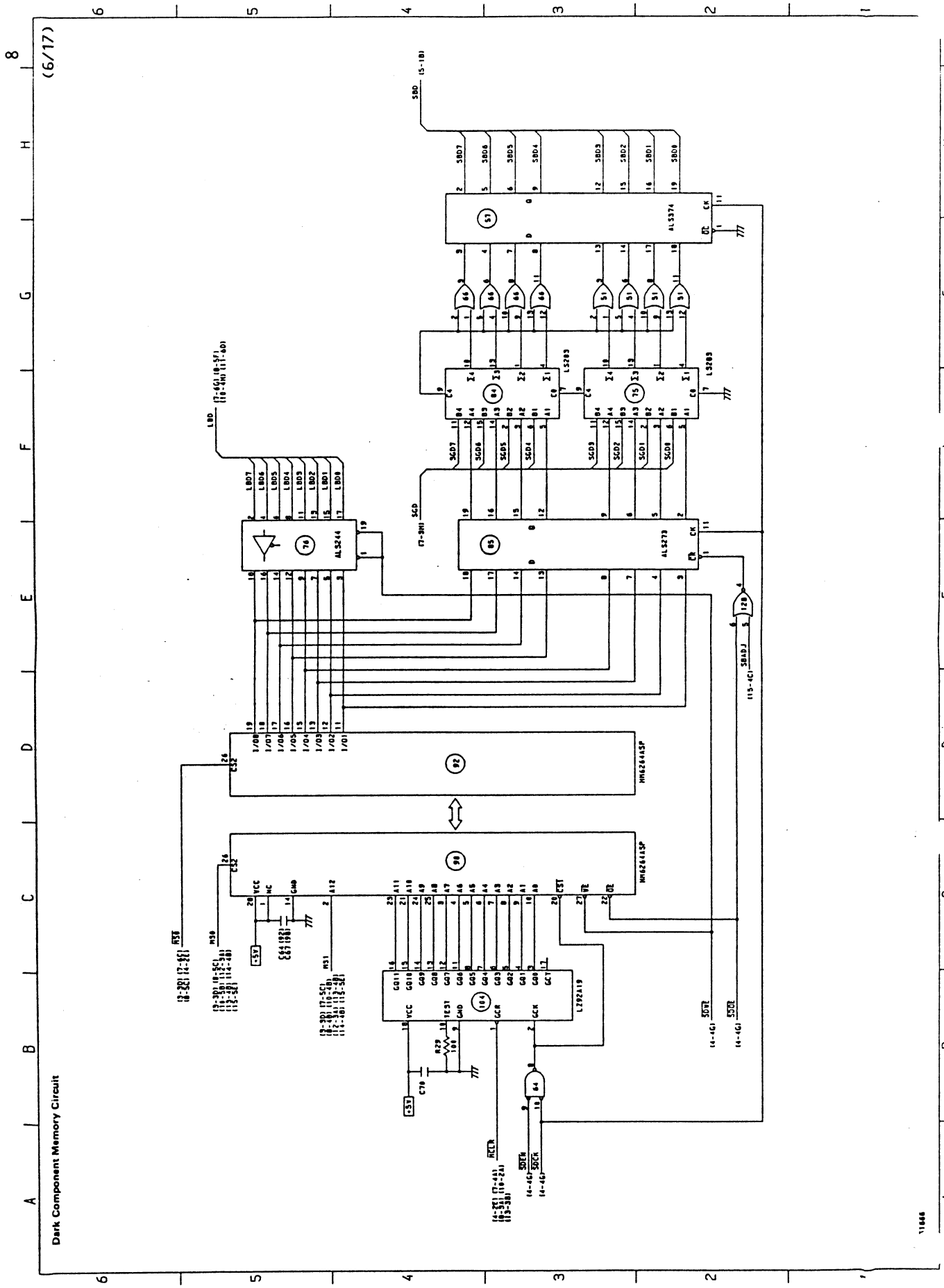

for Europe (2/17)
Switch and Timing Circuit
L1

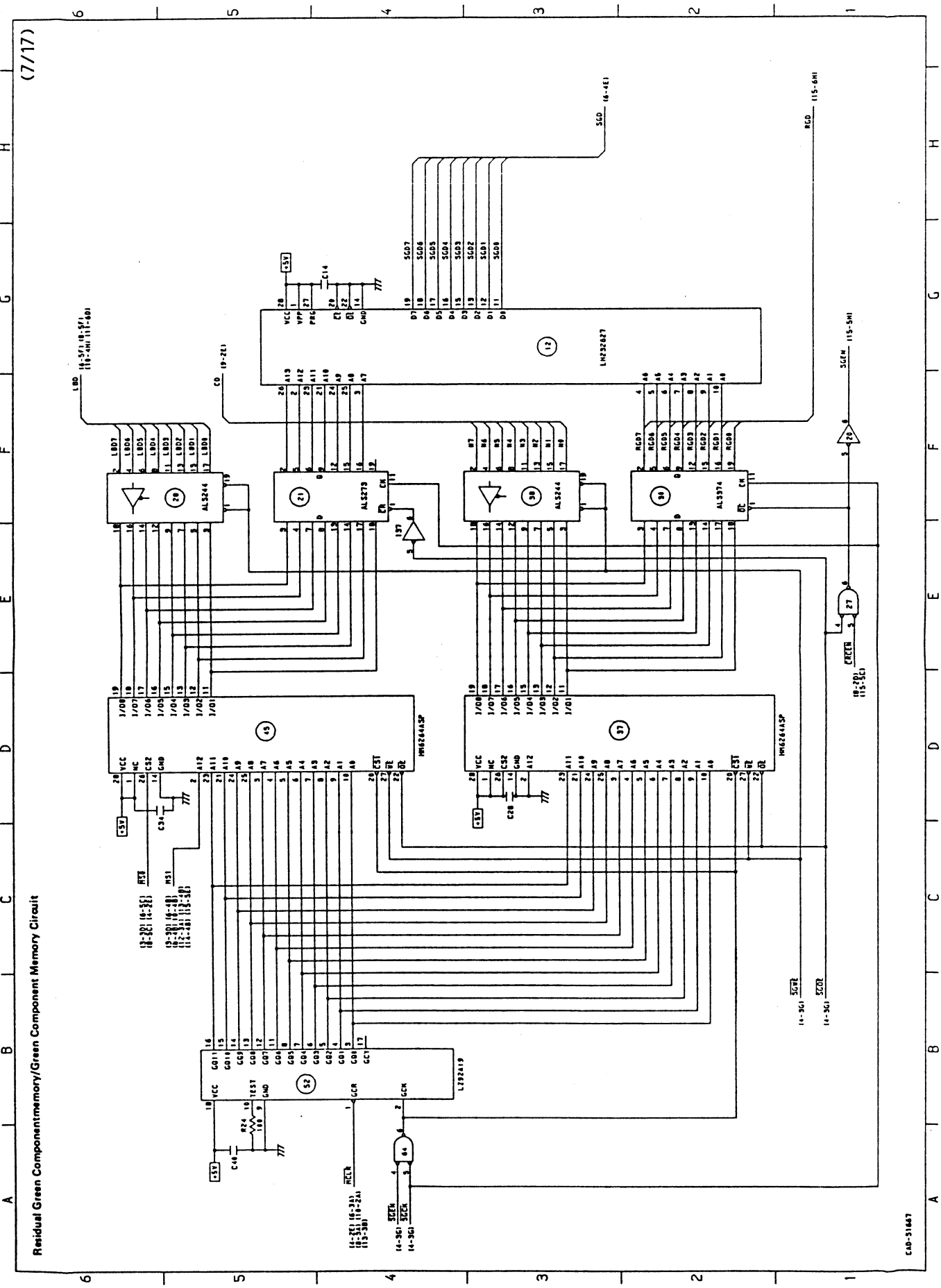

for USA (3/17)
Timing Control Circuit-1

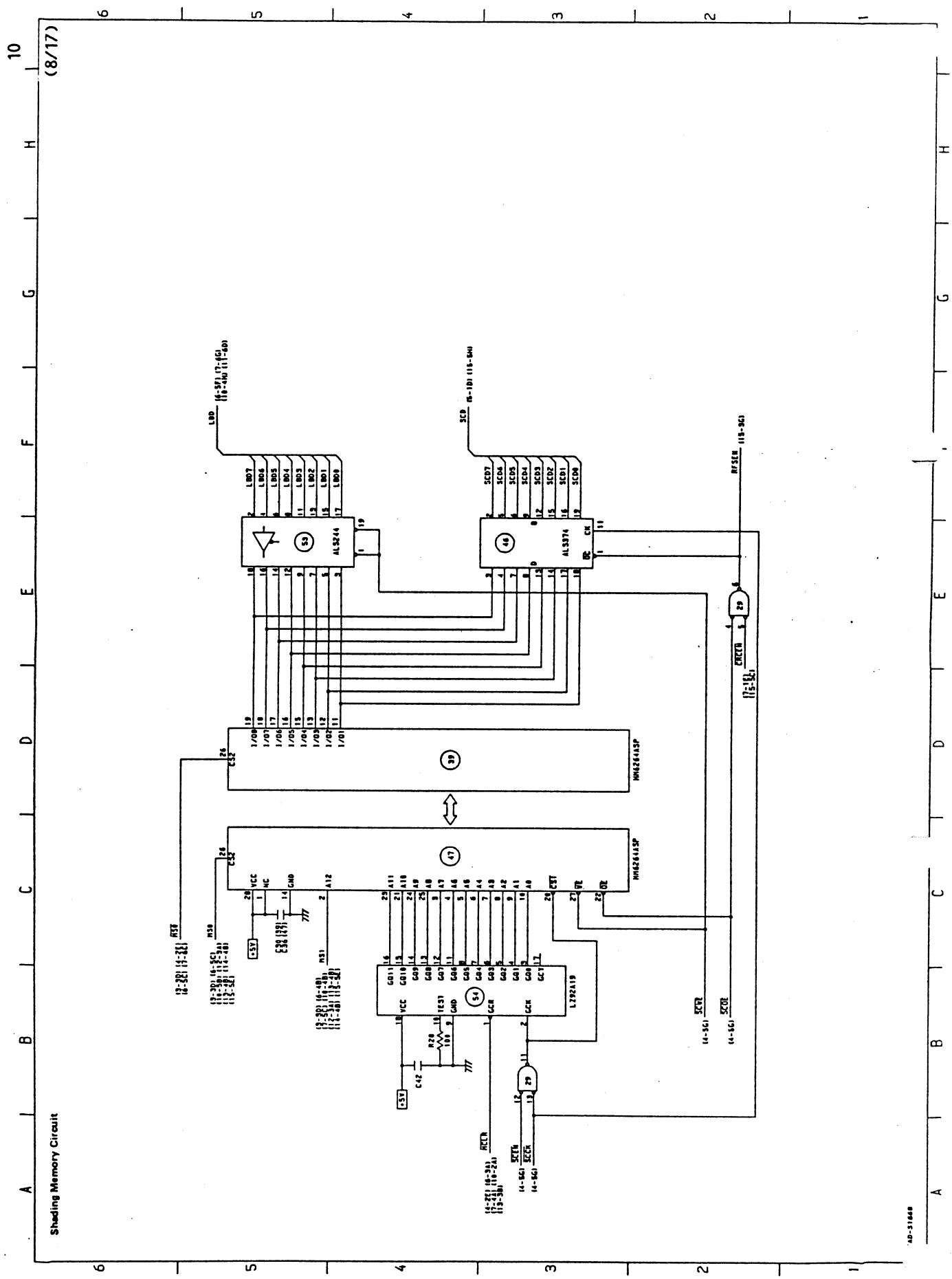

for Europe (3/17)
Timing Control Circuit-1
FAST [4-3A]
FAST [4-4A]
ENSCN [6-2A]

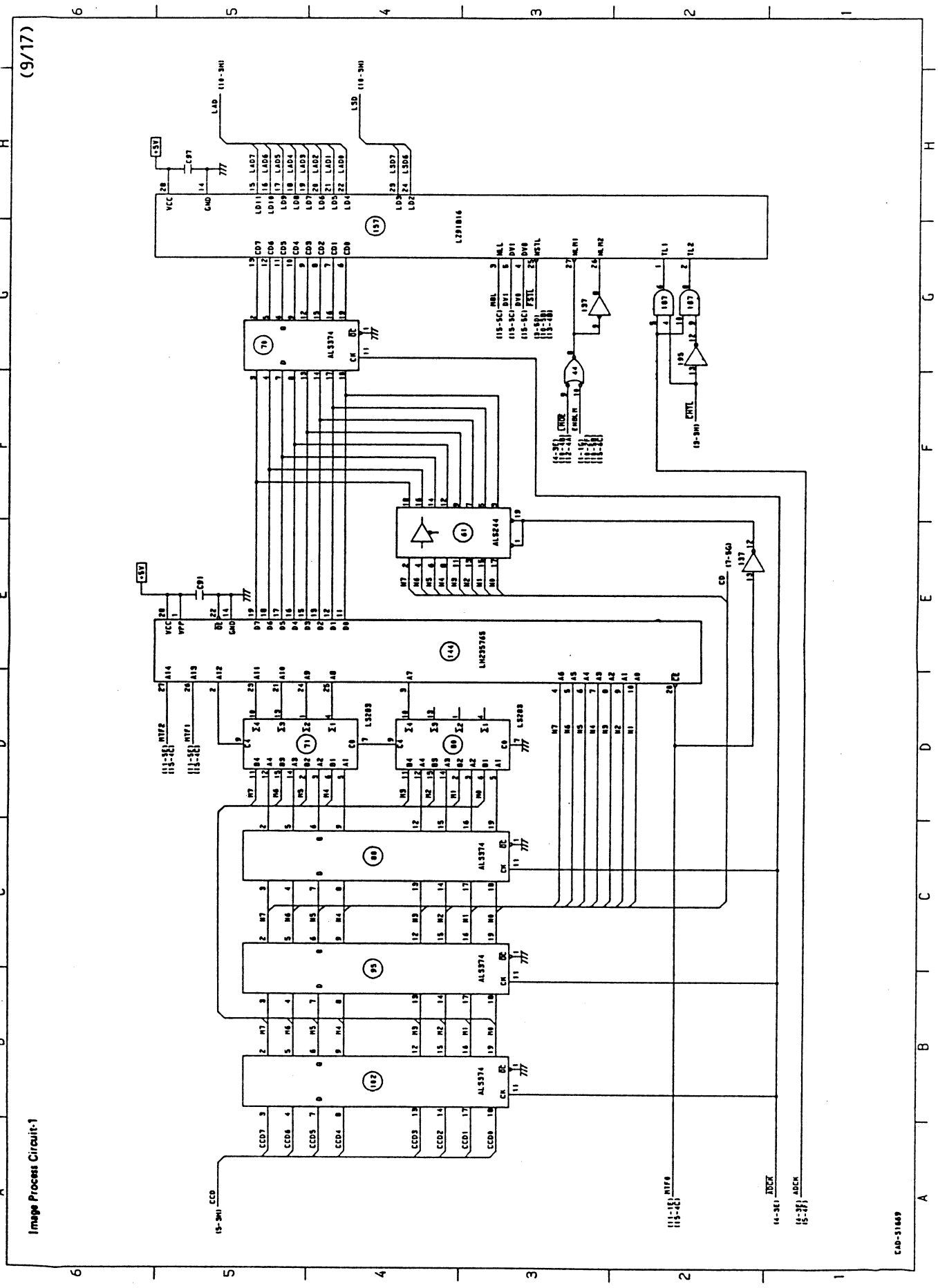

(4/17)
Timing Control Circuit-2

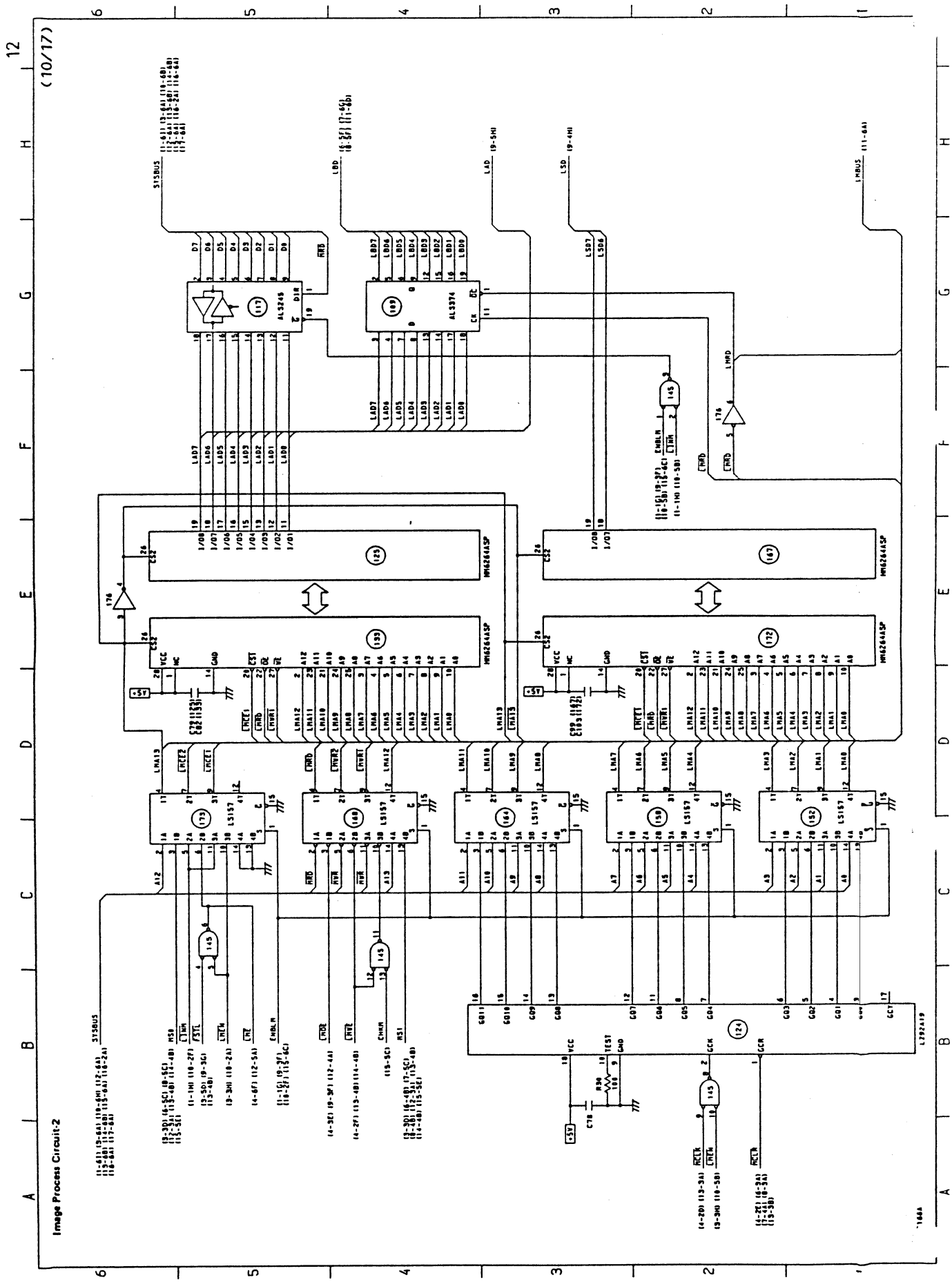

A-D Converter Circuit
(5/17)

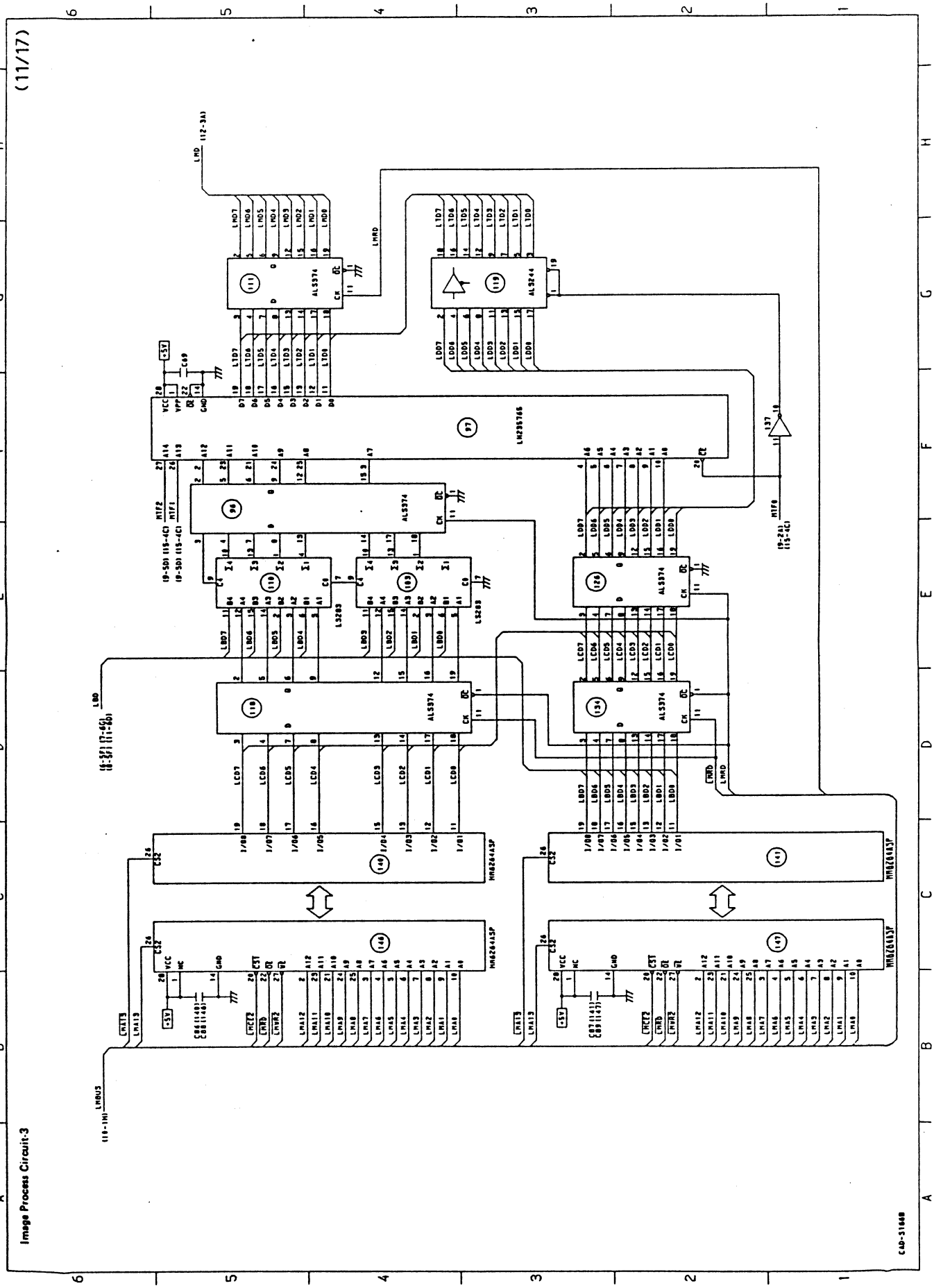

(6/17)
Dark Component Memory Circuit

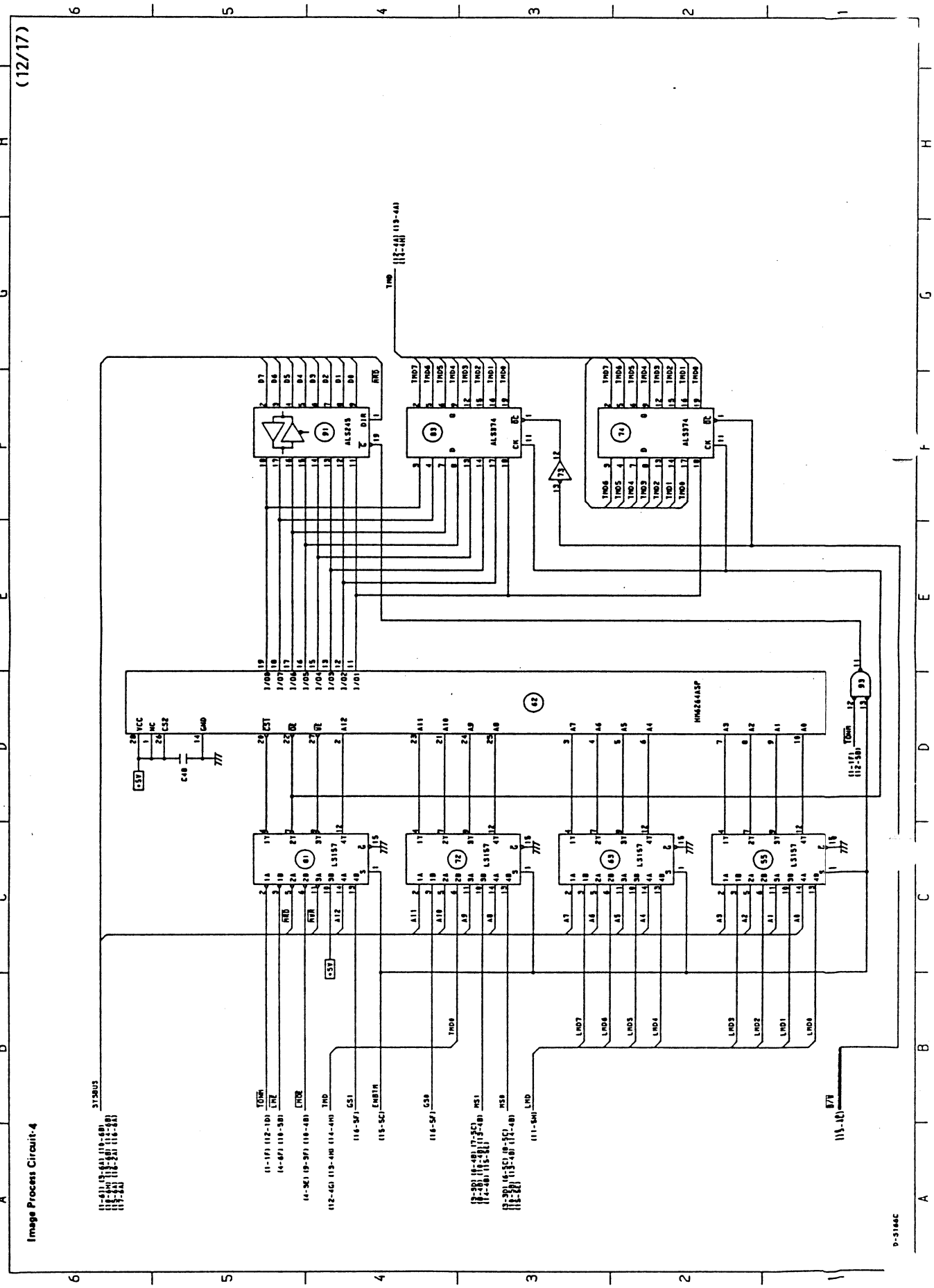

(7/17)
Residual Green Componentmemory/Green Component Memory Circuit
CAD-31647

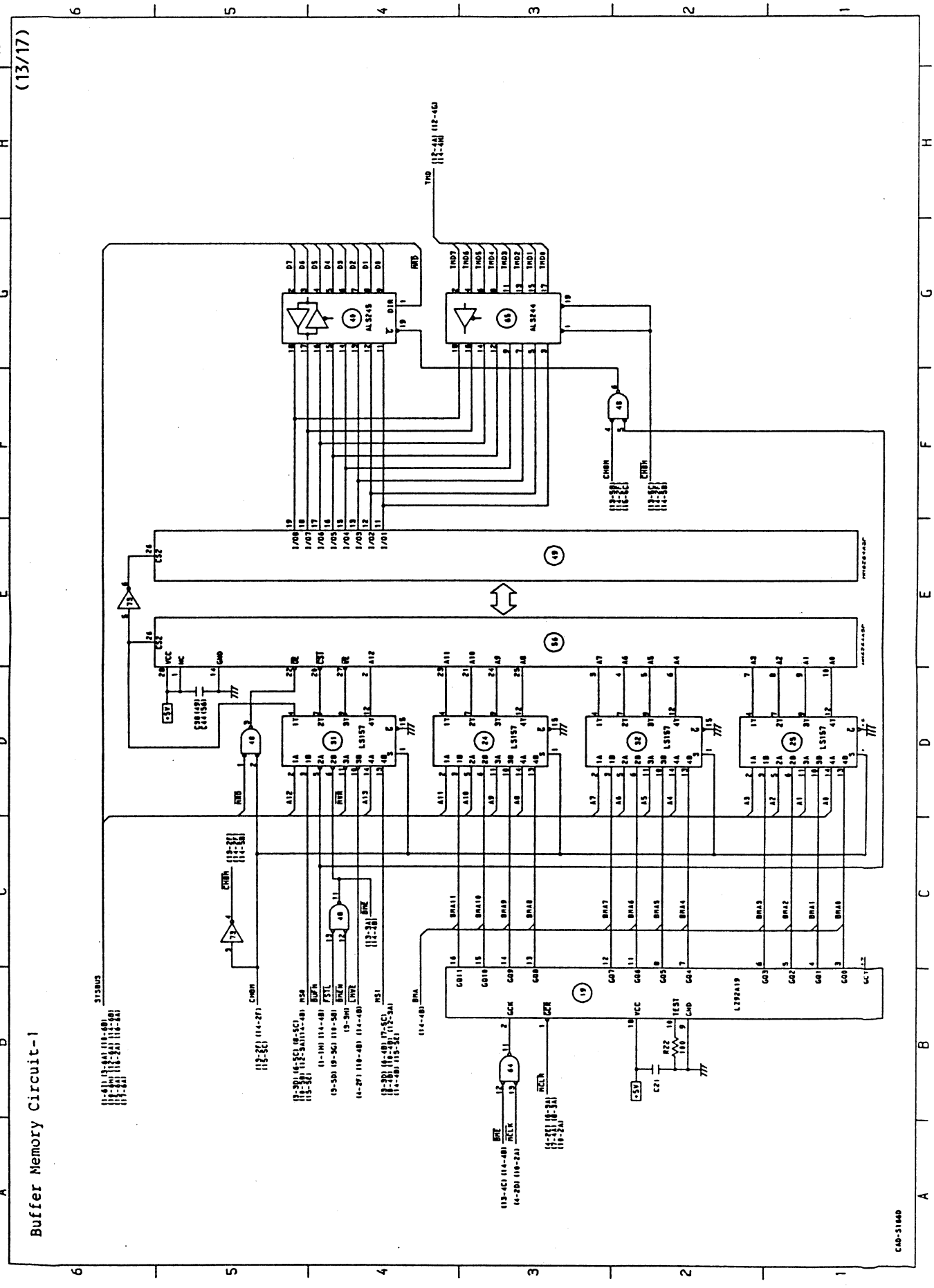

(8/17)
Shading Memory Circuit

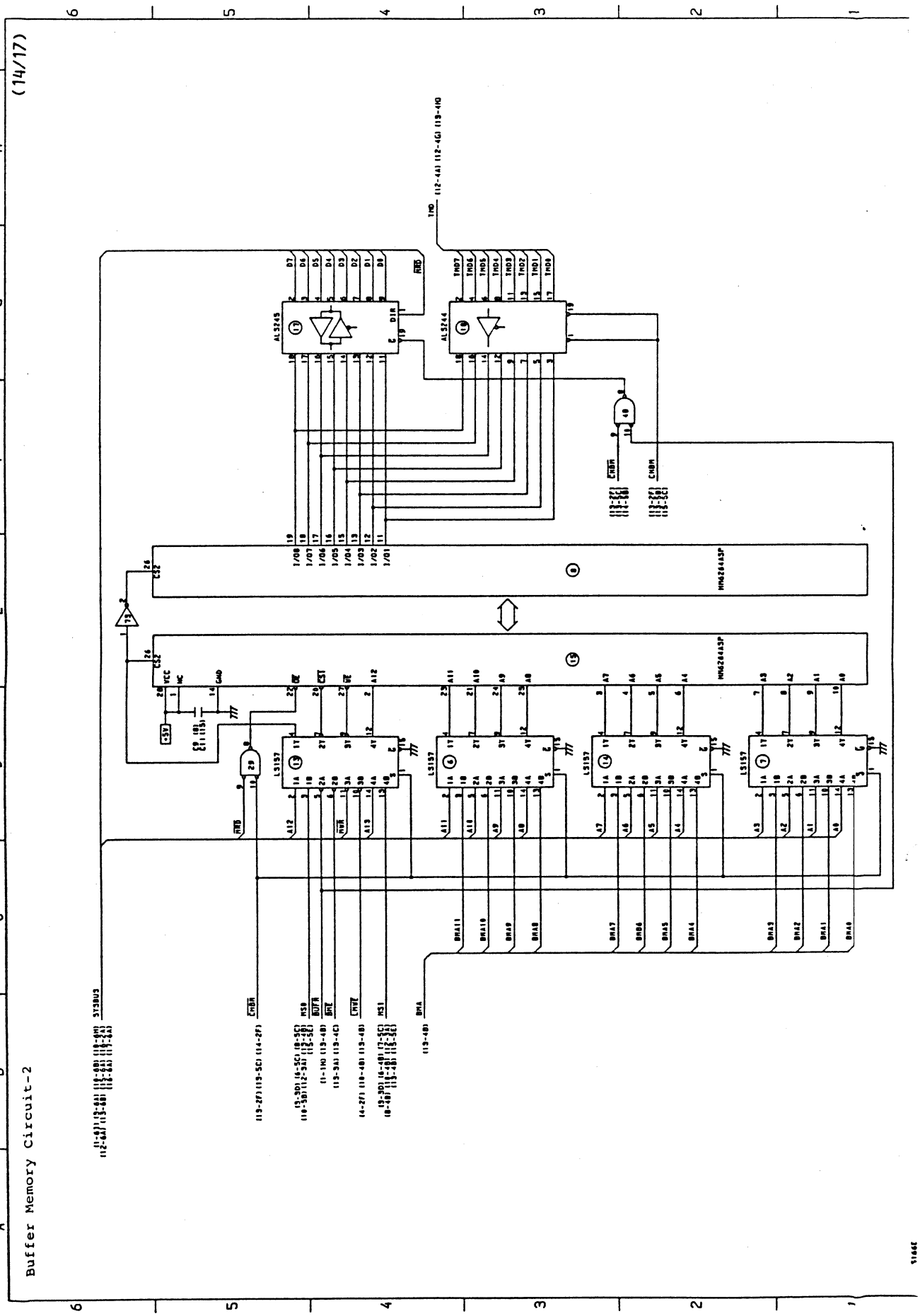

11
(9/17)
Image Process Circuit-1
CAD-31449

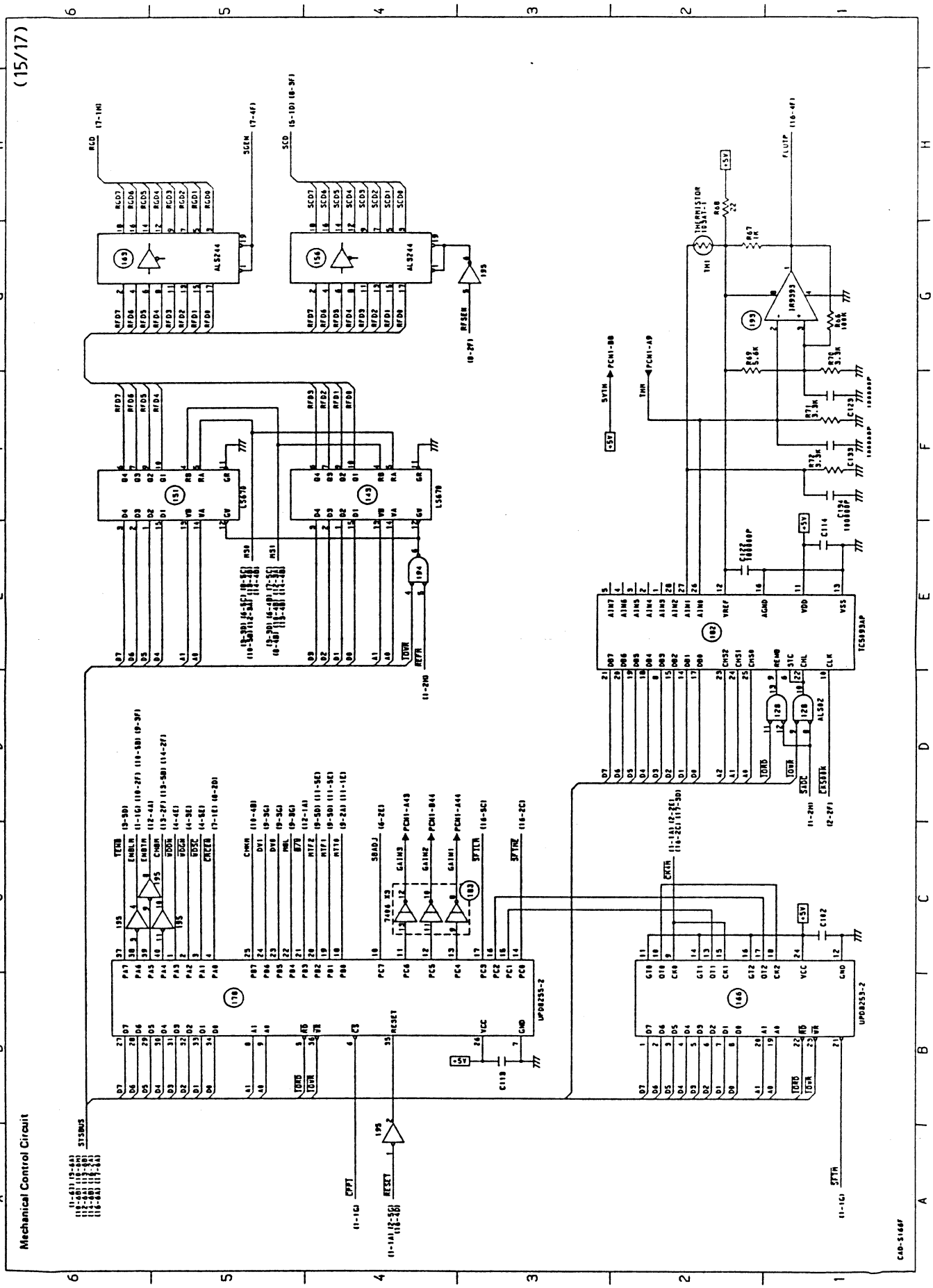

(10/17)
Image Process Circuit-2

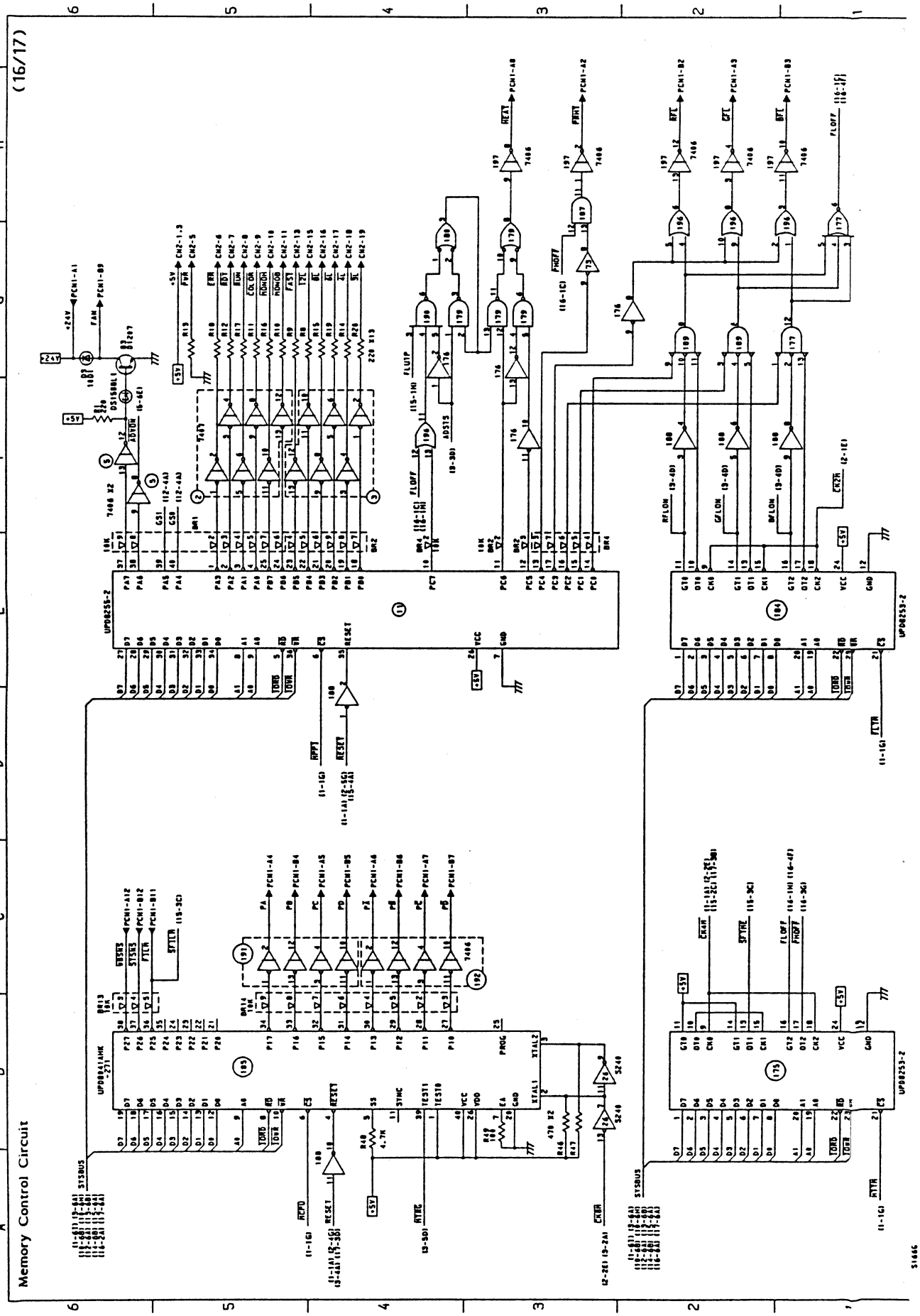

(11/17)
Image Process Circuit-3

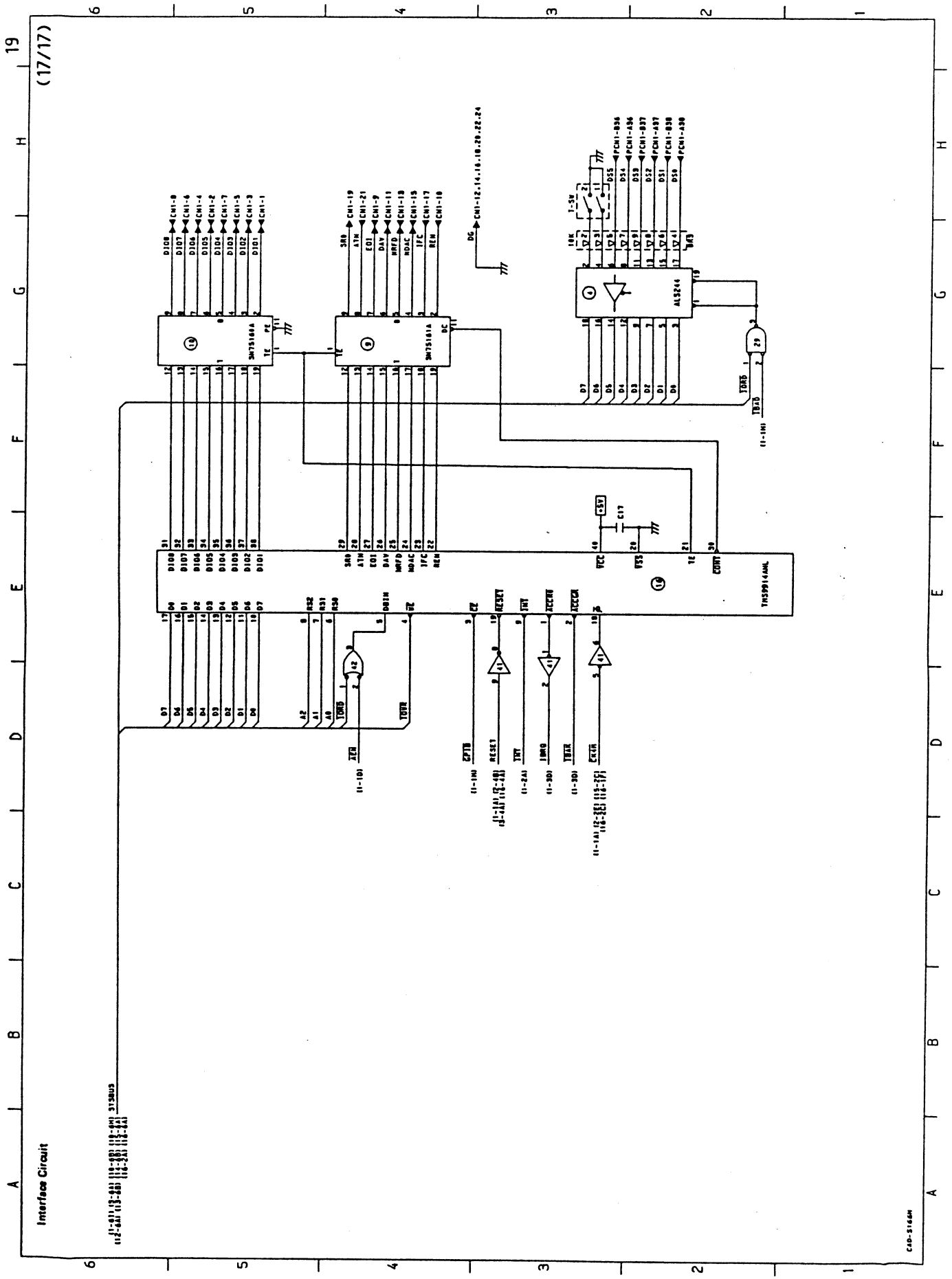

14
(12/17)
Image Process Circuit-4
HM6264ASP
ALS245
ALS374
LS157
D-3146C

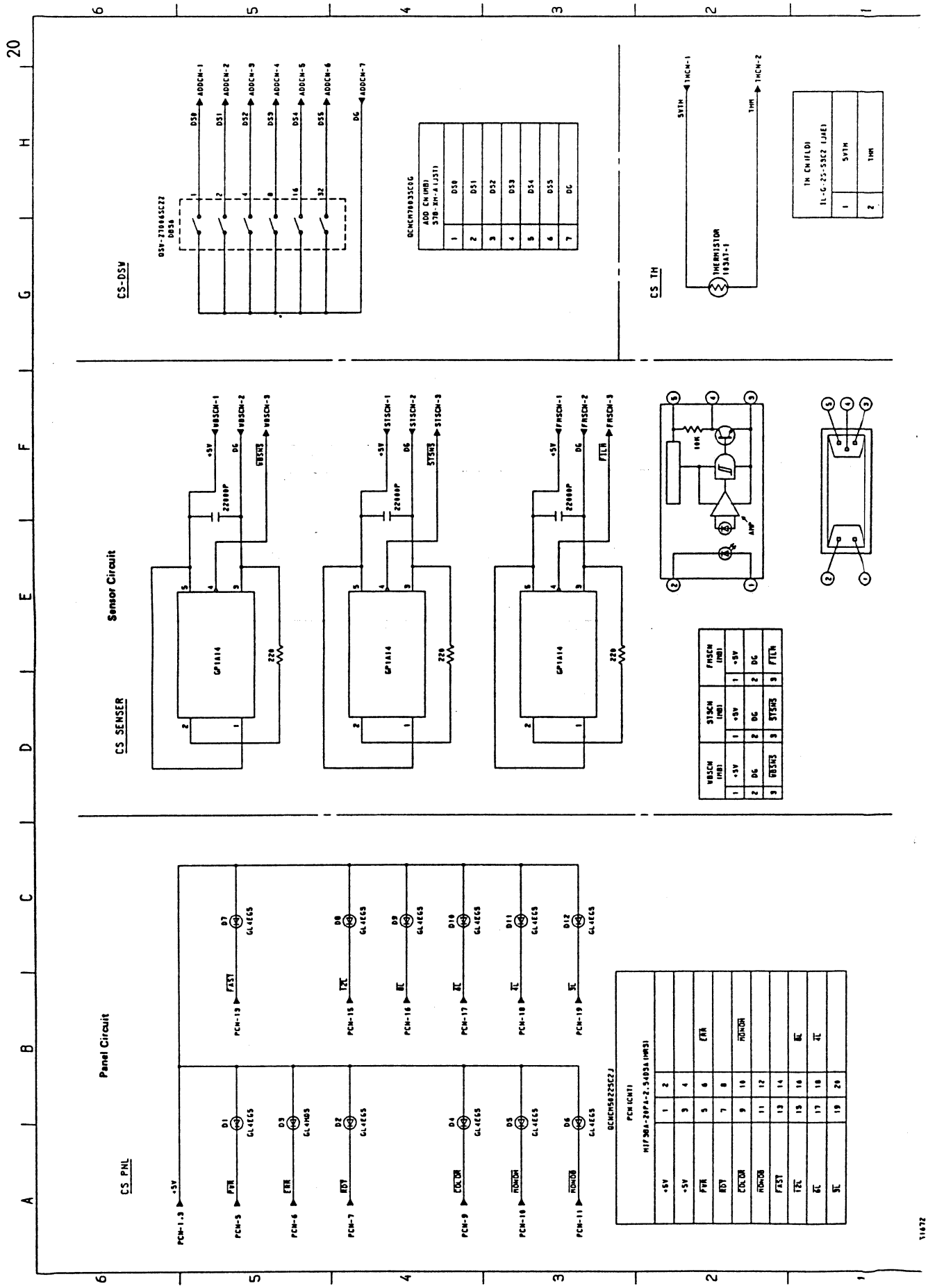

15
(13/17)
Buffer Memory Circuit-1

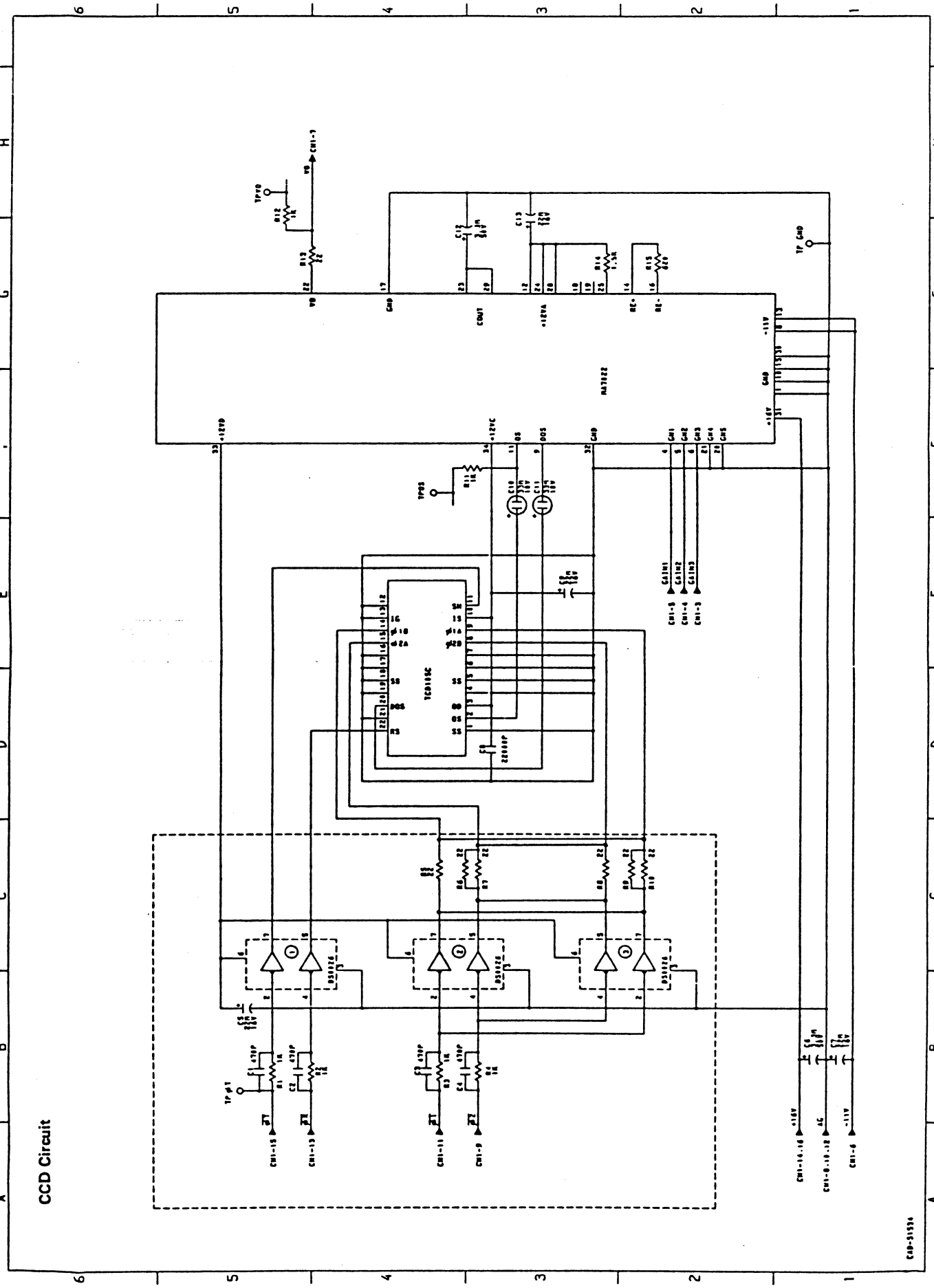

16
(14/17)
Buffer Memory Circuit-2
HM62443SP
LS157
AL3245
AL3244
+5V
CMWR
CMOR
BMA11
BMA10
BMA9
BMA8
BMA7
BMA6
BMA5
BMA4
BMA3
BMA2
BMA1
BMA0


(15/17)
Mechanical Control Circuit


Memory Control Circuit
(16/17)
18

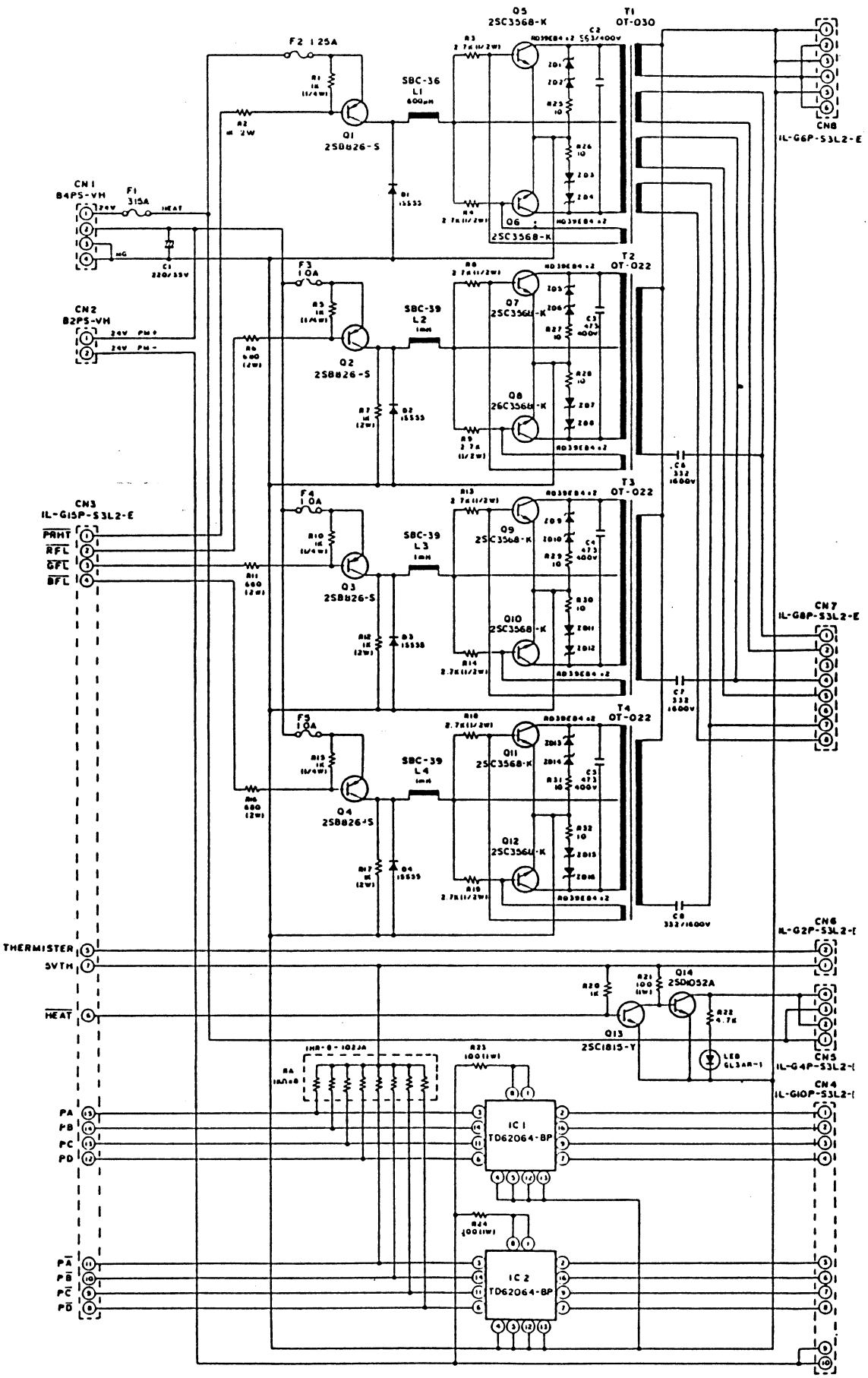

19
(17/17)
Interface Circuit


CS-DSW
CS TH
CS SENSER
Sensor Circuit
CS PNL
Panel Circuit
Sensor Circuit
Panel Circuit



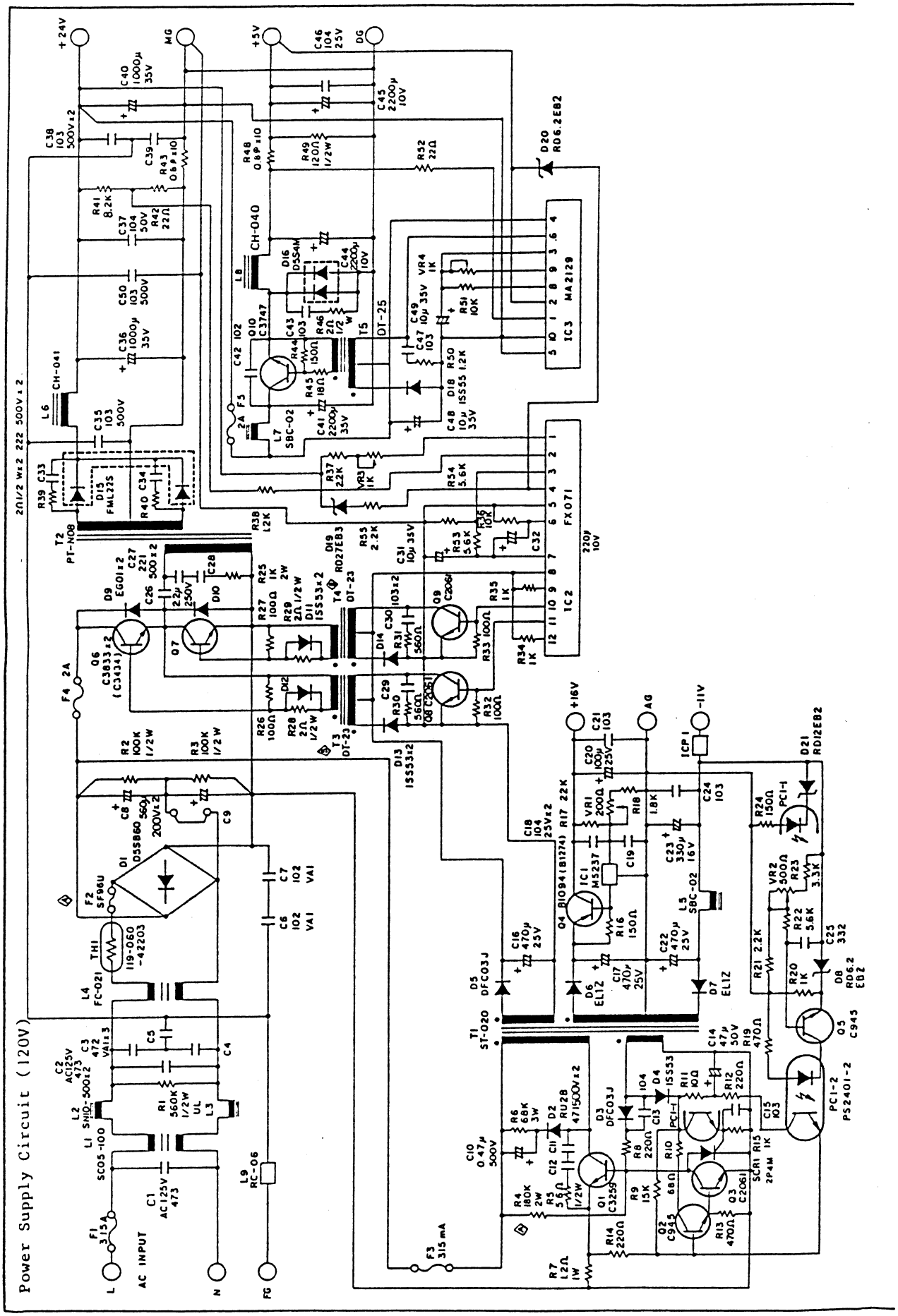
CCD Circuit

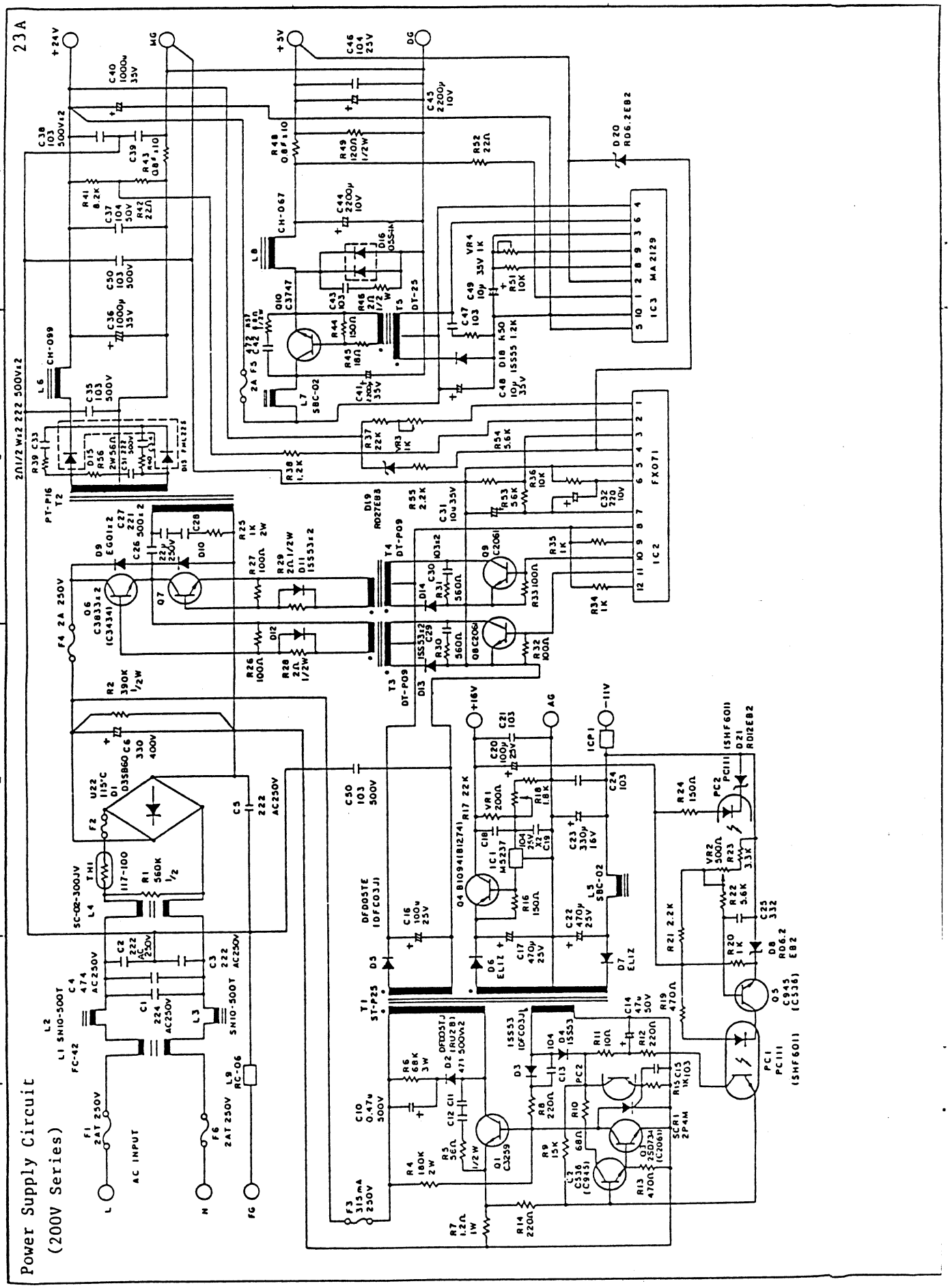
22



Fluorescent Lamp Actuating Circuit

23


Power Supply Circuit (120V)
AC INPUT
L
N
FG
+24V
MG
+5V
DG
+16V
AG
-11V
IC1 MS237
IC2 FX071
IC3 MA2129
T1 ST-020
T2 PT-N08
T3 DT-23
T4 DT-23
T5 DT-25
L1 SCOS-100
L2 SNIO-30012
L3 UL
L4 FC-021
L5 SBC-02
L6 CH-041
L7 SBC-02
L8 CH-040
L9 RC-06
TH1 119-060-42203
F1 3.15A
F2 SF98U
F3 315 mA
F4 2A
F5 2A
D1 05SB60
D2 RU2B
D3 DFC03J
D4 1SS53
D5 DFC03J
D6 EL12
D7 EL12
D8 RD6.2EB2
D9 EG01
D10
D11 1SS53
D12 1SS53
D13 1SS53
D14
D15 FML22S
D16 D554M
D17 RD27EB3
D18 1SS55
D19 RD27EB3
D20 RD6.2EB2
D21 RD12EB2
Q1 C3259
Q2 C945
Q3 C2061
Q4 B1094(B1274)
Q5 C945
Q6 C3833 (C3434)
Q7
Q8 C2061
Q9 C2068
Q10 C3747
PC1-1
PC1-2 PS2401-2
SCR1 2P4M
C1 AC125V 473
C2 AC125V 473
C3 472 VA1.3
C4
C5
C6 102 VA1
C7 102 VA1
C8 560μ 200V±2
C9
C10 0.47μ 500V
C11
C12 104
C13 104
C14 47μ 50V
C15 103
C16 470μ 25V
C17 470μ 25V
C18 104 25V±2
C19
C20 100μ 25V
C21 103
C22 470μ 25V
C23 330μ 16V
C24 103
C25 332
C26 22μ 250V
C27 221 500±2
C28
C29
C30 103±2
C31 10μ 35V
C32 220μ 10V
C33
C34
C35 103 500V
C36 1000μ 35V
C37 104 50V
C38 103 500V±2
C39
C40 1000μ 35V
C41 2200μ 35V
C42 102
C43 103
C44 220μ 10V
C45 2200μ 10V
C46 104 25V
C47 103
C48 10μ 35V
C49 10μ 35V
R1 560K 1/2W
R2 100K 1/2W
R3 100K 1/2W
R4 180K 2W
R5 56Ω 1/2W
R6 68K 3W
R7 1.2Ω 1W
R8 220Ω
R9 15K
R10 68Ω
R11 10Ω
R12 220Ω
R13 470Ω
R14 220Ω
R15 1K
R16 150Ω
R17 22K
R18 1.8K
R19 470Ω
R20 1K
R21 2.2K
R22 5.6K
R23 3.3K
R24 150Ω
R25 1K 2W
R26 100Ω
R27 100Ω
R28 2Ω 1/2W
R29 2Ω 1/2W
R30 560Ω
R31 560Ω
R32 100Ω
R33 100Ω
R34 1K
R35 1K
R36 10K
R37 2.2K
R38 1.2K
R39 C33
R40 C34
R41 8.2K
R42 22Ω
R43 0.68±10
R44 150Ω
R45 18Ω
R46 2Ω 1/2W
R47 103
R48 0.68±10
R49 120Ω 1/2W
R50 1.2K
R51 10K
R52 22Ω
R53 5.6K
R54 5.6K
R55 2.2K
VR1 200Ω
VR2 500Ω
VR3 1K
VR4 1K
2II/2 W±2 222 500V±2


Power Supply Circuit
(200V Series)
23A
AC INPUT
+24V
MG
+5V
DG
+16V
AG
-11V
IC1 M5237
IC2 FX071
IC3 MA2129
T1 ST-P25
T2 PT-P16
T3 DT-P09
T4 DT-P09
T5 DT-25
L1 SN10-500T
L2 SN10-500T
L3 SN10-500T
L4 SC-02-300JV
L5 SBC-02
L6 CH-099
L7 SBC-02
L8 CH-067
L9 RC-06
F1 2AT 250V
F2 2A 250V
F3 315mA 250V
F4 2A 250V
F6 2AT 250V
FC-42
PC1 PC111 (SHF6011)
PC2 PC111 (SHF6011)
SCR1 2P4M
D1 C3259
D2 DFD03TJ (RU2B1)
D3 1SS53 (DFC03JJ)
D4 1SS53 (DFC03JJ)
D5 DFB05TE (DFC03JJ)
D6 ELI2
D7 ELI2
D8 RD6.2 EB2
D9 EG01×2
D10 C3747
D11 1SS53×2
D12 1SS53×2
D13 1SS53×2
D14 1SS53×2
D15 R56 2W 56Ω
D16 0SS-14
D18 1SS35
D19 RD27EB3
D20 RD6.2EB2
D21 RD12EB2
Q1 C3259
Q2 C536 (C945)
Q3 2SD734 (C2061)
Q4 B1094 (B1274)
Q6 C3833×2 (IC3434)
Q7
Q8 C2061
Q9 C2061
Q10 C2061
C40 1000μ 35V
C43 2200μ 10V
C44 2200μ 10V
C45 2200μ 10V
C46 104 25V
C47 103
C48 10μ 35V
C49 10μ 35V
C50 103 500V
C36 1000μ 35V
C38 103 500V×2
C39
C41 1200μ 35V
R1 560K 1/2
R2 390K 1/2W
R4 180K 2W
R5 56Ω 1/2W
R6 68K 3W
R7 1.2Ω 1W
R8 220Ω
R9 15K
R10
R11 10Ω
R12 220Ω
R13 470Ω
R14 220Ω
R15 C15 1K103
R16 150Ω
R17 22K
R18 18K
R19 470Ω
R20 1K
R21 2.2K
R22 5.6K
R23 3.3K
R24 150Ω
R25 1K 2W
R26 100Ω
R27 100Ω
R28 2Ω 1/2W
R29 2Ω 1/2W
R30 560Ω
R31 560Ω
R32 100Ω
R33 100Ω
R34 1K
R35 1K
R36 10K
R37 22K
R38 1.2K
R39 C33
R41 8.2K
R42 22Ω
R43 0.8Ω 1/10
R44 150Ω
R45 18Ω
R46 2Ω 1/2W
R48 0.8Ω 1/10
R49 120Ω 1/2W
R50 1.2K
R51 10K
R52 22Ω
R53 5.6K
R54 5.6K
R55 2.2K
VR1 200Ω
VR2 500Ω
VR3 1K
VR4 1K
C1 224 AC250V
C2 222 AC250V
C3 222 AC250V
C4 474 AC250V
C5 222 AC250V
C6 330 400V
C10 0.47μ 500V
C11
C12
C13 104
C14 47μ 50V
C16 100μ 25V
C17 470μ 25V
C18 104 25V
C19 X7R
C20 100μ 25V
C21 103
C22 470μ 25V
C23 330μ 16V
C24 103
C25 332
C26 500×2
C27 221
C28
C30 103×2
C31 10μ 35V
C32 220 10V
C33
C35 103 500V
C37 104 50V
TH1 117-100
U22 115°C 01 035860
2Ω1/2 W×2 222 500V×2

SHARP PARTS GUIDE

COLOR SCANNER

MODEL JX450

CONTENTS

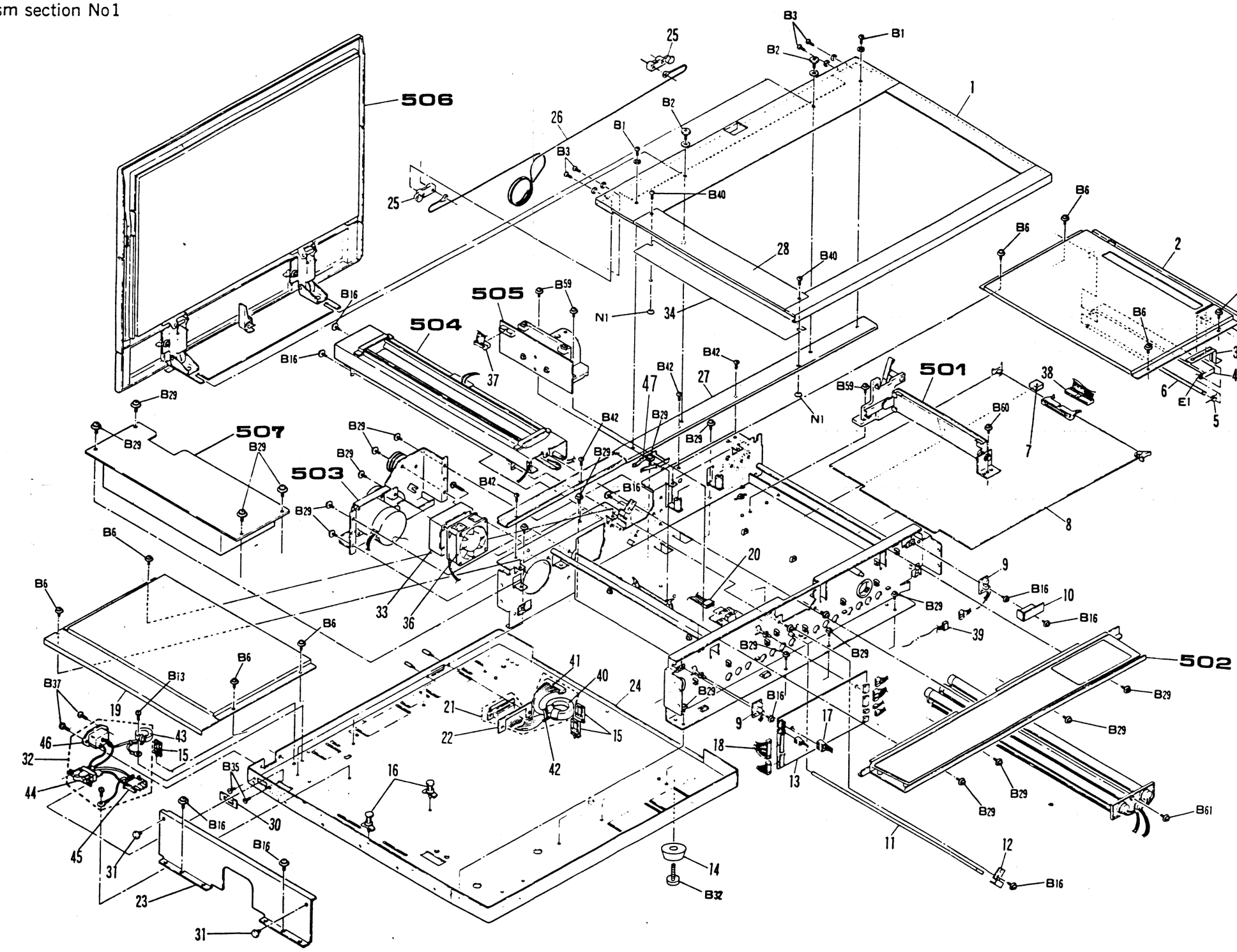
1 Mechanism section No. 1
2 Cabinet
3 Operation unit
4 Rotating mirror unit
5 Light source unit
6 Drive unit
7 Original cover
8 Lens maunt unit
9 Frame unit
10 Mirror unit (Cx500T1/T2)
11 Packing material & Accessories
12 Packing material & Accessories (CX500T1/T3)
13 CCD board
14 Control board
15 Power supply unit (USA)
16 Power supply unit (Europe)
17 Flourescent lamp board
18 Mother board
19 Panel board
20 Address switch board
21 Lamp thermistor board
22 SNS board
50 Hardware parts
■ Index

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

1 Mechanism section No1

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CGLSN7001SC05	BU		E	Glass table ass'y
2	GCOVH7008SCZZ	BD		C	Cover R
3	PSHEZ7005SCZZ	AC		C	Cover sheet
4	GFTAZ7001SCZZ	AH		C	Cover plate
5	MSPRC7027SCZZ	AB		C	Spring,cover plate
6	NSFTZ7028SCZZ	AG		C	Shaft,cover plate
7	PGUMS7002SCZZ	AE		C	Rubber,PWB
8	DUNTK7803SCZZ	**	N	E	Control board [Ref.Block 12] [USA]
	DUNTK7816SCZZ	**	N	E	Control board [Ref.Block 12] [Europe]
9	CPWBE3008SC50	AT		E	SNS PWB unit
10	PGiDM7011SCZZ	AK		C	Angle,senser
11	PMiR-7001SCZZ	AS		C	Mirror 1
12	LPLTM7015SCZZ	AE		C	Mirror holder,mirror 1
13	DUNTK7031SCZZ	BR		E	Fluorescent lamp actuating PWB
14	GLEGG2007SCZZ	AE		C	Rubber foot
15	LHLDZ7015SCZZ	AB		C	Cable holder
16	LBSHZ7003SCZZ	AD		C	Bushing
17	QCNW-7037SCZZ	AG		C	Cable,mecha.Power
18	QCNW-7038SCZZ	AL		C	Cable,mecha.Control
19	GCOVH7014SCZZ	BA		C	Cover,Left
20	QCNW-7039SCZZ	AG		C	Cable D-Switch
21	CCNW-7032SC01	BF		E	Cable ass'y,GPIB
22	LPLTM7026SCZZ	AC		C	Plate,fitting connector
23	LPLTM7025SCZZ	AH		C	Separator plate [USA]
	LPLTM7025SCZA	AM	N	C	Separator plate [Europe]
24	CiTAU7002SC01	BX		C	Plate,bottom [I
	CiTAU7002SC02	BX	N	C	Plate,bottom [Eur
25	LHLDW7004SCZA	AF		C	Wire holder
26	PWiR-7001SCZZ	AP		C	Wire
27	MSLi-7001SCZZ	BA		C	Table slider
28	PGiDH7018SCZD	AS		C	Table angle
30	TLABP7025SCZA	AL		C	Label,power supply
31	LBSHZ2006SCZZ	AB		C	Bushing (NRP-345)
⚠ 32	CCNW-7033SC01	BB		E	AC switch ass'y [USA]
⚠	CCNW-7085SC01	BE	N	E	AC switch ass'y [Europe]
33	LANGT7068SCZZ	AM		C	Duct,fan
34	PSHEZ7047SCZZ	AF		C	Sheet
36	NFANP7003SCZZ	BE		C	FAN
37	QCNW-7020SCZZ	AP		C	Cable,CCD
38	QCNW-7035SCZZ	AR		C	Cable,panel [USA]
	QCNW-7084SCZZ	AV	N	C	Cable,panel [Europe]
39	QCNW-7024SCN1	AN		C	Cable SNS1
40	RCORF2002SCZZ	AW		C	Core (ESD-R47) [USA]
	RCORF1001ACZZ	AK	N	C	Core (ESD-R25D) [Europe]
41	QCNW-7032SCZZ	BB		C	Cable,GPIB
42	LBNDJ2003SCZZ	AA		C	Cable clamp (large)
43	RCORF2004SCZZ	AM		C	Core (ESD-R25)
44	QSW-C9223QCZZ	AM		B	AC switch
45	QCNW-7033SCZZ	AG		C	Cable,power supply [USA]
	QCNW-7085SCZZ	AM	N	C	Cable,power supply [Europe]
46	QCNW-7041SCZZ	AM		C	AC inlet cable [USA]
	QCNW-7086SCZZ	AG	N	C	AC inlet cable [Eur
47	MSPRP7045SCZZ	AH		C	Spring,table slider
501	———				Rotating mirror unit [Ref.Block]
502	———				Operation unit [Ref.Block 3]
503	———				Drive unit [Ref.Block 6]
504	———				Light soure unit [Ref.Block 5]
505	DUNTM7118SCZZ	CG		E	Lens mount unit [Ref.Block 8] [USA]
	DUNTM7161SCZZ	CG	N	E	Lens mount unit [Ref.Block 8] [Europe]
506	———				Original cover [Ref.Block 7]
507	DUNTK7055SCZZ	CD		E	Power supply [Ref.Block 13] [USA]
	DUNTK7159SCZZ	CF	N	E	Power supply [Ref.Block 3] [Europe]

1 Mechanism section No1



2 Cabinet

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCABC7003SCZA	AQ		D	Cabinet R [USA]
	GCABC7003SCZC	AQ	N	D	Cabinet R [Europe]
2	CCABA7001SC02	AX		D	Cabinet F
3	GCABD7004SCZZ	AM		D	Cabinet L
4	QCAPC2001RCZZ	AD		C	Cap
5	GCABB7002SCZZ	AS		D	Cabinet R

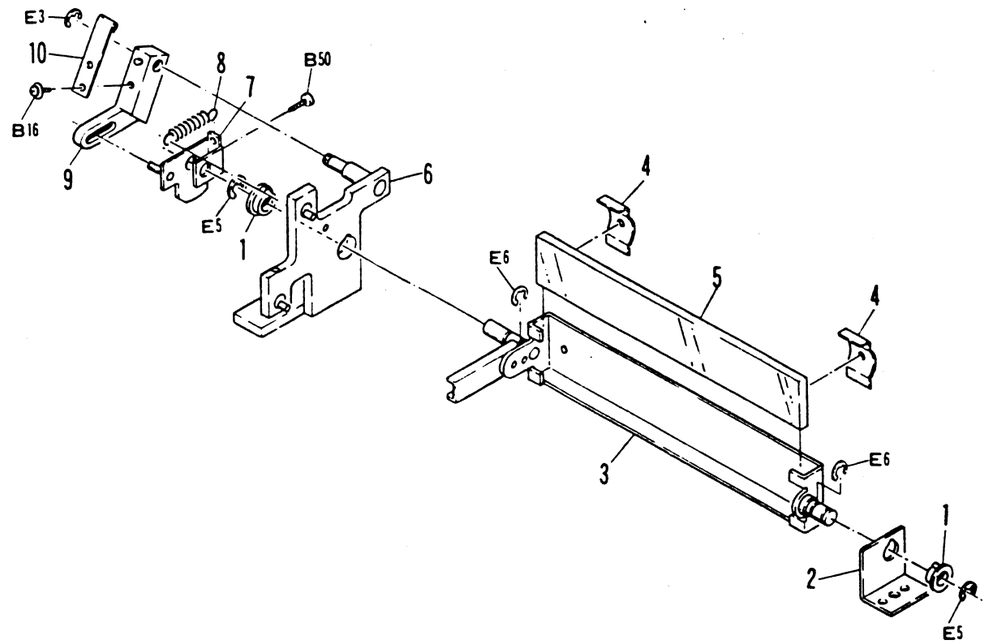
3 Operation unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	PSHEZ7014SCZZ	AW		C	Panel sheet
2	GDAi-7003SCZZ	AN		C	Cabinet
3	CPWBN3022SC01	BH		E	Panel board
4	LANGT7041SCZA	BD		C	Panel angle
5	PSHEF7020SCZZ	AE		C	Sheet,panel angle
6	PGUMS7006SCZZ	AF		C	Rubber,board
7	LANGF7099SCZZ	AG		C	Panel support angle

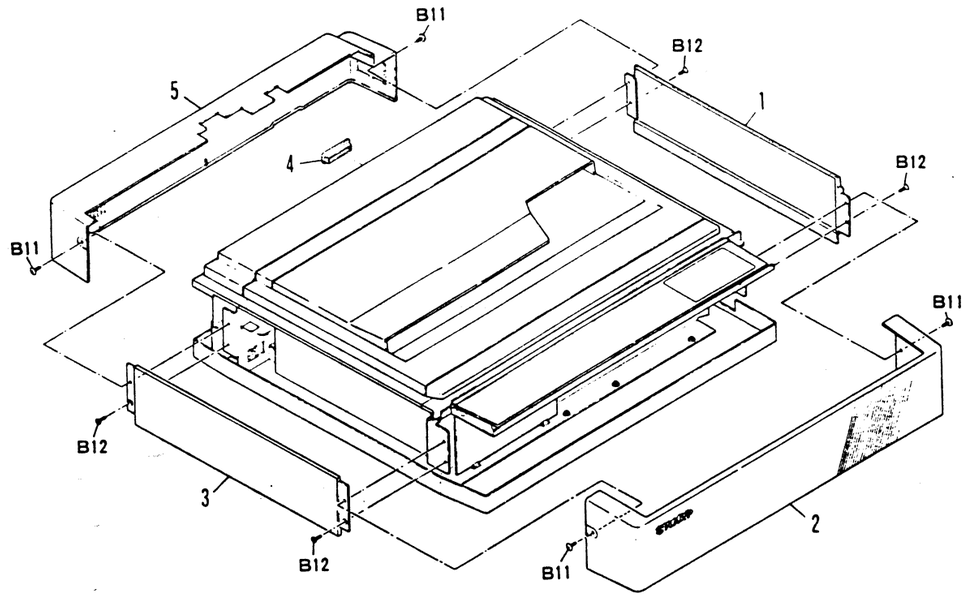
4 Rotating mirror unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	NBRGC2019SCZZ	AC		C	Bearing
2	GDAi-7001SCZZ	AF		C	Mirror support table R
3	CHLDZ7011SC01	AT		C	Rotating mirror holder
4	MSPRC7023SCZZ	AE		C	Mirror holding spring
5	PMiR-7003SCZZ	AR		C	Mirror 2
6	CDAi-7002SC02	BD		C	Mirror support table F
7	CANGT7040SC01	AH		C	Mirror angle control angle
8	MSPRC7025SCZZ	AB		C	Mirror spring
9	MLEVP7005SCZZ	AD		C	Mirror angle control lever
10	MSPRC7024SCZZ	AE		C	Lever spring

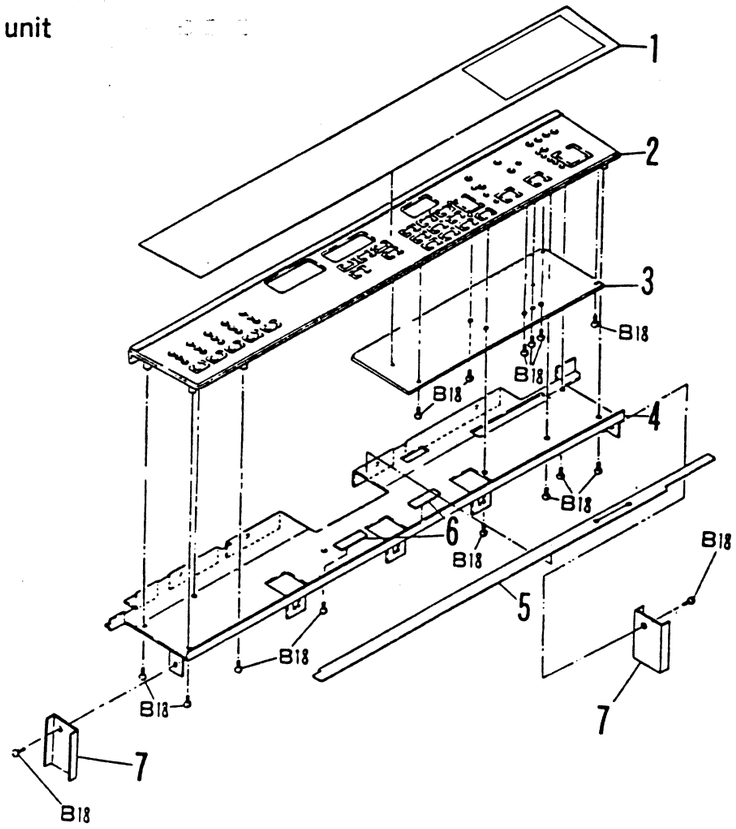
4 Rotating mirror unit



2 Cabinet

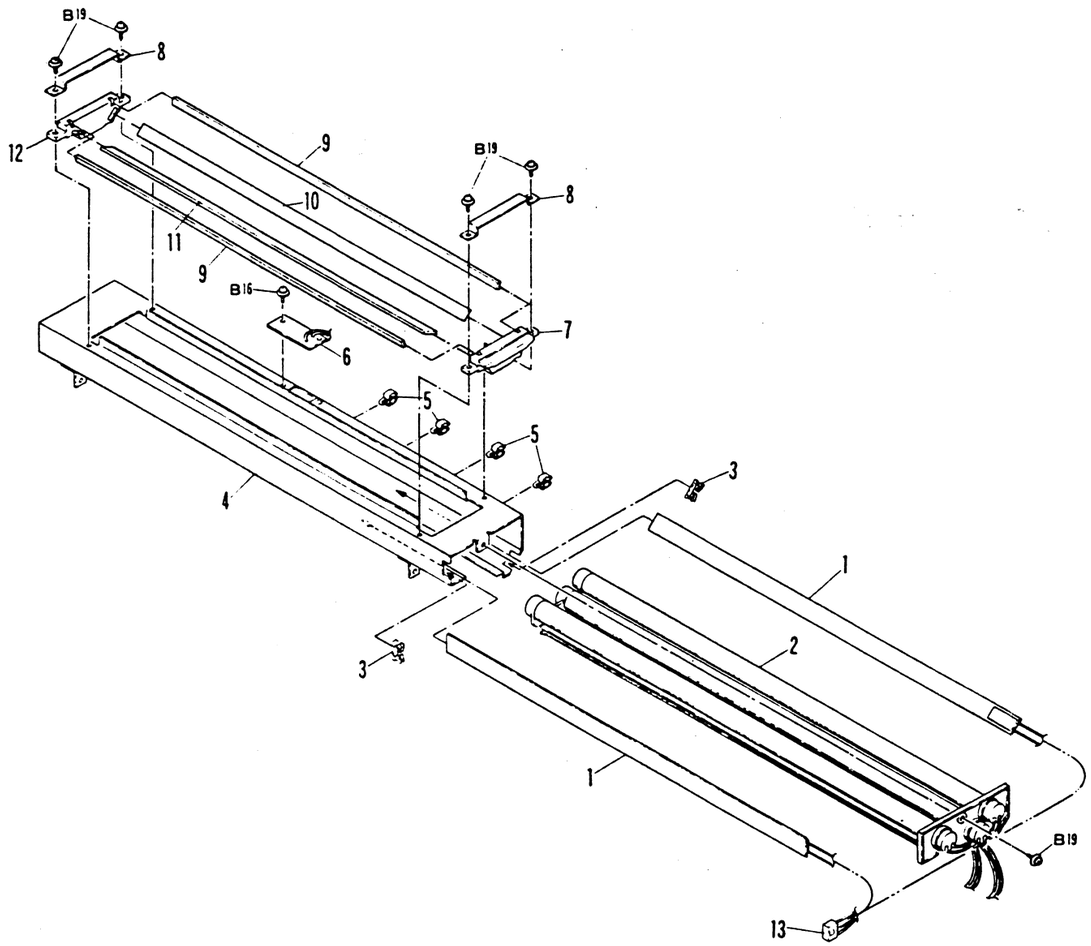


3 Operation unit



5 Light source unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	RHET-7001SCZZ	AU		B	Lamp heat (15W 24V)
2	CLMPZ7001SC01	BQ		E	Lamp ass'y
3	LBSHZ2037SCZZ	AD		C	Bushing
4	GBOXD7001SCZZ	BK		C	Lamp box
5	LHLDW2102SCZZ	AB		C	Cable holder (UAMS-02-0)
6	CPWBE3009SC01	AT		E	Lamp thermistor PWB unit
7	LHLDW7006SCZZ	AD		C	Filter holder F
8	LPLTM7019SCZZ	AE		C	Plate
9	PMIR-7002SCZZ	AQ		C	Reflect mirror
10	PFILW7002SCZZ	BE		C	Blue filter
11	PFILW7001SCZZ	BC		C	Red filter
12	LHLDW7007SCZZ	AD		C	Filter holder R
13	QCNCW7004SC0D	AB		C	Connector (4pin)



6 Drive unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	NBLTK7002SCZZ	AH		C	Belt (112T)
2	NPLYZ7002SCZZ	AP		C	Pulley (MXL76)
3	NSFTZ7021SCZZ	AK		C	Drive shaft
4	CFRM-7010SC01	AV		C	Drive frame
5	NBRGC2019SCZZ	AC		C	Bearing
6	RMOTZ7005SCZZ	BM		B	Drive motor
7	NPLYZ2016SCZZ	AG		C	Mini pitch pulley (21T)
10	NPLYZ7003SCZZ	AU		C	Drive pulley
12	NPLYZ0043FCZZ	AF		C	Double pulley
13	MSPRC7021SCZZ	AC		C	Tension spring
14	CARMM7005SC01	AK		C	Tension arm

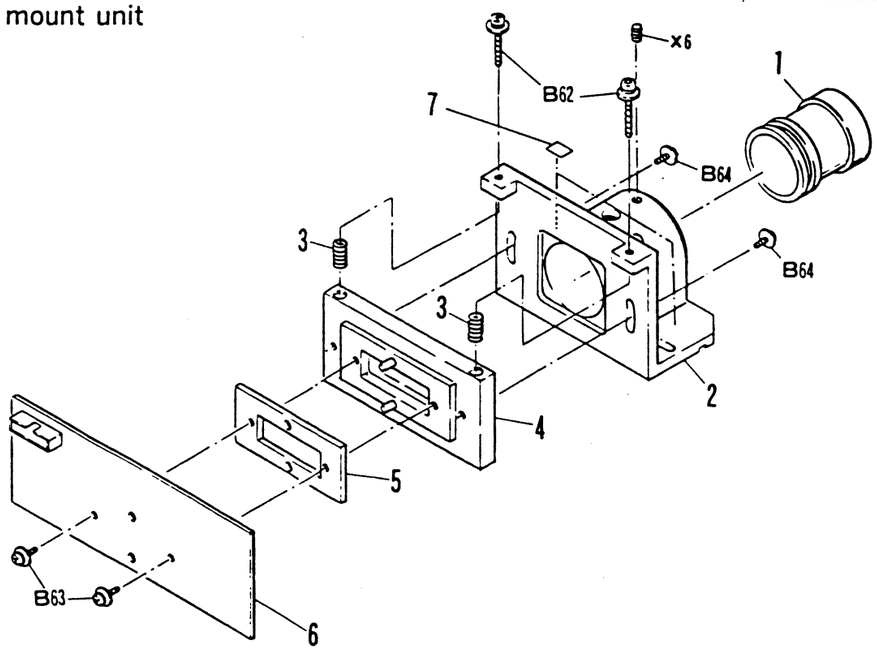
7 Original cover

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCOVH0135FCZA	AY		C	Original cover(L)
2	GCOVH0136FCZA	AQ		C	Original cover(S)
3	MHNG-7002SCZZ	BC		C	Original cover hinge
4	LHLDZ0502FCZZ	AV		C	OR stocker
5	PSHEZ7085SCZZ	AY		C	Original cover sheet
6	CCOVH0135SC03	BB		E	Original cover ass'y (inlude No.1,4)

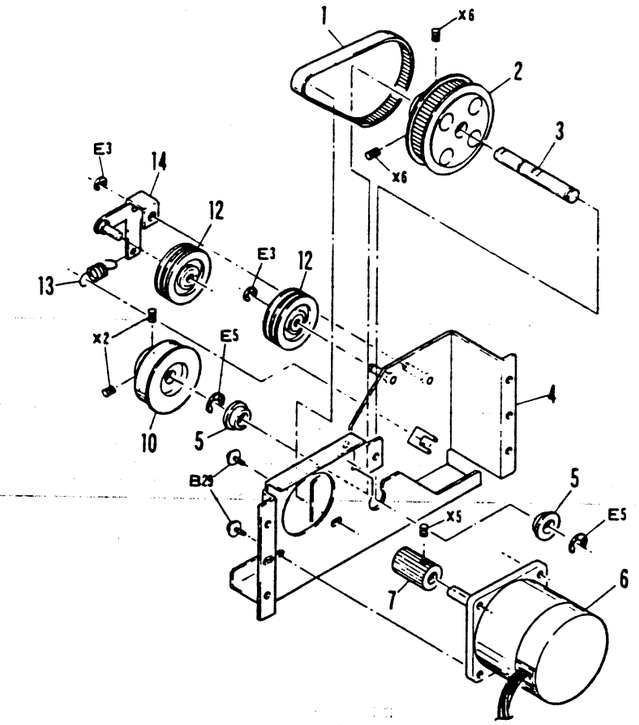
8 Lens mount unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CLNS-7001SC01	BU		C	Lens ass'y
2	LHLDZ7009SCZZ	AZ		C	Lens holder
3	MSPRC7022SCZZ	AB		C	Adjust spring
4	LHLDZ7010SCZZ	AY		C	CCD holder
5	LPLTM7014SCZA	AC		C	Adjust plate
6	CPWBN3005SC02	CB		E	CCD PWB unit [USA]
	CPWBX3066SC01	CC	N	E	CCD PWB unit [Europe]
7	PSHEZ7030SCZZ	AB		C	Mark sheet
	(Unit)				
901	DUNTM7118SCZZ	CG		E	Lens mount unit [USA]
	DUNTM7161SCZZ	CG	N	E	Lens mount unit [Europe]

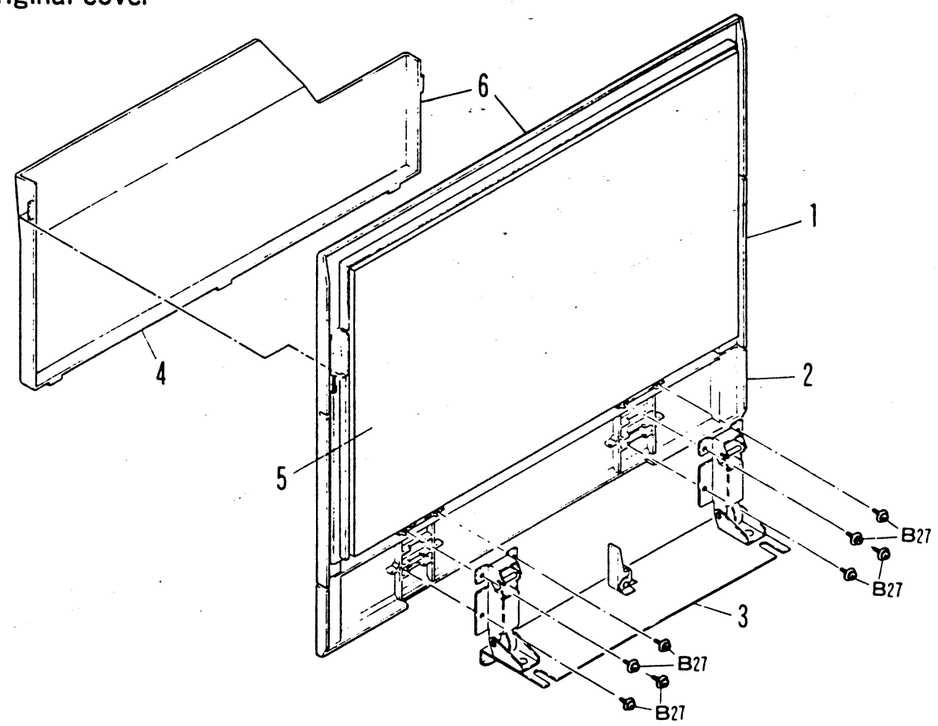
8 Lens mount unit



6 Drive unit



7 Original cover



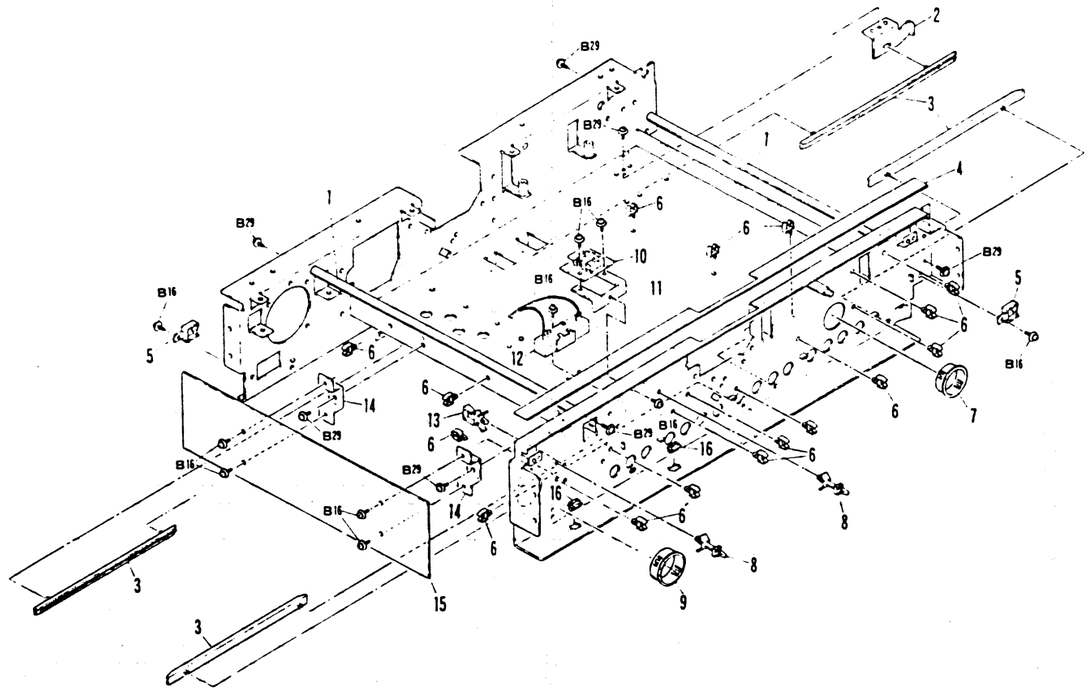
9 Frame unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LSTYM7005SCZZ	AQ		C	Stay,frame
2	LANGT7038SCZZ	AF		C	Angle,PWB lever
3	LRAL-7002SCZZ	AF		C	Guide,PWB
4	PSHEZ7004SCZZ	AD		C	Sheet
5	LHLDW2048SCZZ	AB		C	Cable holder
6	LHLDW5031BCZZ	AA		C	Cable holder
7	LBSHC2019SCZZ	AC		C	Bushing
8	LHLDF2339RCZZ	AB		C	PWB holder
9	LBSHC2020SCZZ	AC		C	Bushing
10	CPWBE3024SC01	AY		E	Address switch board
11	LPLTM7016SCZZ	AL		C	Plate,address switch board
12	RR-WZ7001SCZZ	AL		C	Resistor
13	LHLDW7005SCZZ	AB		C	Cable holder
14	LPLTM7017SCZZ	AL		C	Plate,mother board
15	CPWBN3023SC01	BM		E	Mother board [USA]
	CPWBX3065SC01	BM	N	E	Mother board [Europe]
16	LBSHC5020BCZZ	AB		C	Bushing,PWB guide

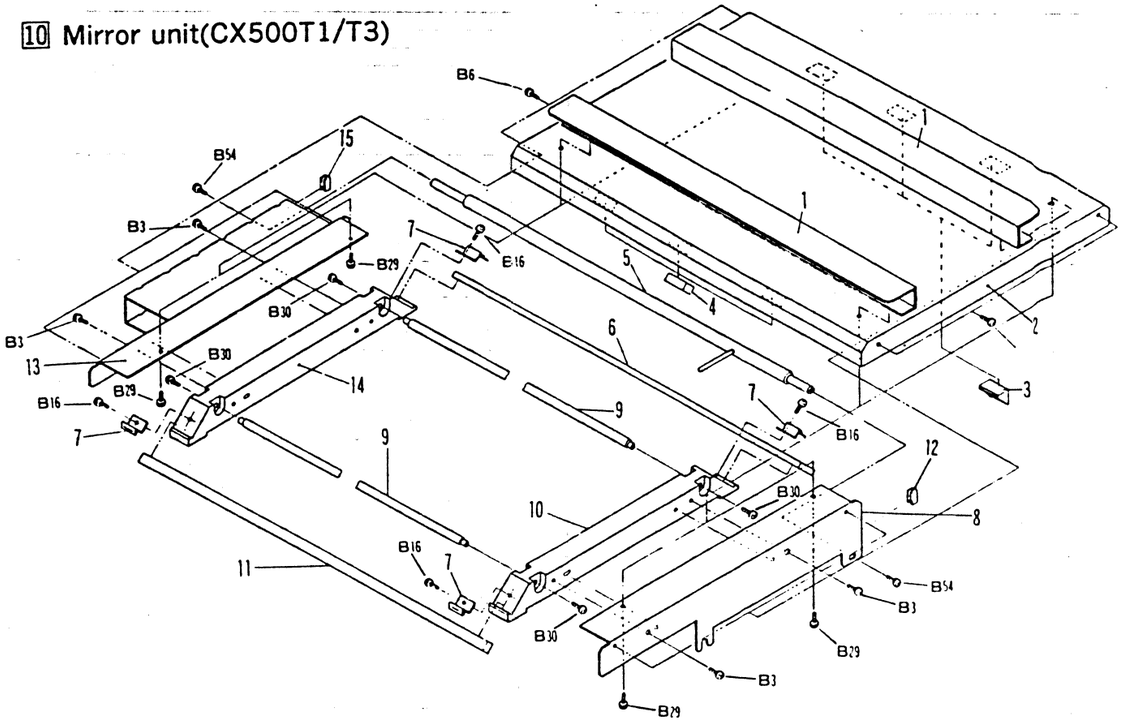
10 Mirror unit(CX500T1/T3)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LANGZ7070SCZZ	AU		C	Catch angle
2	GCOVH7015SCZZ	BH		C	Cover UP
3	PGUMS7004SCZZ	AG		C	Protector rubber
4	PGUMS7003SCZZ	AG		C	Protector rubber
5	NSFTZ7036SCZZ	AN		C	Shaft
6	PMiR-7005SCZZ	AR		C	Mirror 4
7	LANGK7069SCZZ	AB		C	Holder,mirror
8	LFRM-7011SCZZ	AP		C	Frame F
9	LSTYM7007SCZZ	AT		C	Stay
10	LHLDZ7017SCZZ	BA		C	Mirror holder
11	PMiR-7004SCZZ	AR		C	Mirror 3
12	LBSHC0096FCZZ	AA		C	Bushing
13	LFRM-7012SCZZ	AV		C	Frame R
14	LHLDZ7017SCZA	BA		C	Mirror holder
15	LBSHC7004SCZZ	AB		C	Bushing

9 Frame unit



10 Mirror unit(CX500T1/T3)



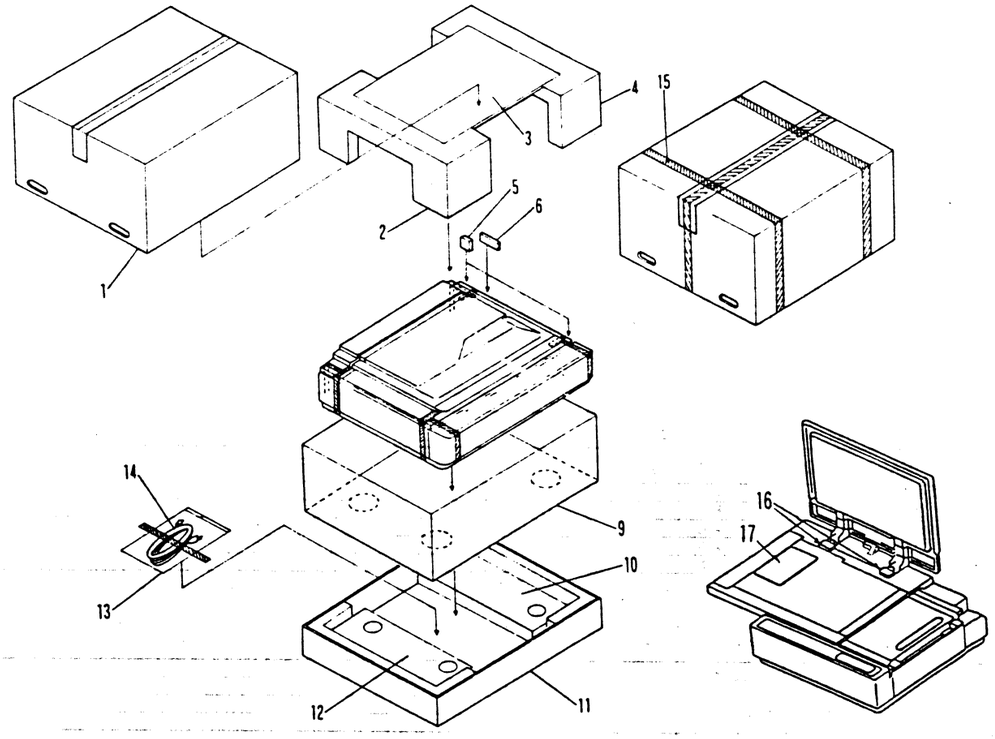
11 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	SPAKC7027SCZZ	AW	N	D	Packing case	[USA]
	SPAKC7117SCZZ	AW	N	D	Packing case	[W.Germany]
	SPAKC7118SCZZ	AW	N	D	Packing case	[U.K]
2	SPAKA7029SCZZ	AQ		D	Packing add upper L	
3	SPAKA7043SCZZ	AF		D	Packing add	
4	SPAKA7028SCZZ	AQ		D	Packing add upper R	
5	PGUMS7005SCZZ	AD		C	Rubber,cover protector	
6	PSHEZ7024SCZZ	AA		C	Sheet,lever protector	
9	SPAKP7026SCZZ	AG		C	Vinyl bag	
10	SPAKA7030SCZZ	AN		D	Packing add lower R	
11	SPAKA7032SCZZ	AN		D	Packing add lower base	
12	SPAKA7031SCZZ	AN		D	Packing add lower L	
13	SSAKA3001CCZZ	AA		D	Vinyl bag (140×360㎜)	
⚠ 14	QACCD7611QCZZ	AT		B	AC cord	[USA]
⚠	QACCV6620QCZZ	AV		B	AC cord	[W.Germany]
⚠	CCNW-2795SC01	AW		B	AC cord	[U.K]
15	SBNDN0007FCZZ	AC		D	Band	
16	PGUMS7010SCZZ	AB		C	Rubber protector	
17	TCAUH7007SCZZ	AD		C	Caution note	
101	TINSE7003SCZZ	BL	N	D	Ope.Manual	[USA]
	TINSM7011SCZZ	BL	N	D	Ope.Manual	[W.Germany]
	TINSE7012SCZZ	BL	N	D	Ope.Manual	[U.K]
102	PSHEZ7043SCZZ	AE		C	Sheet,OC holder	

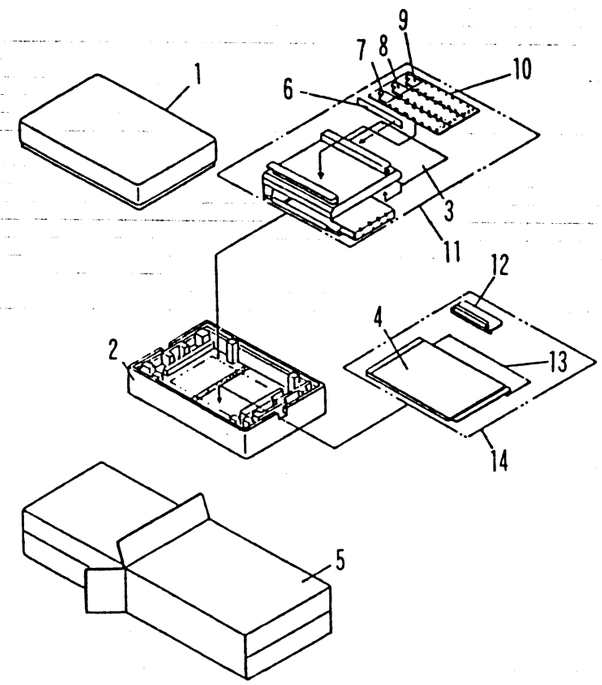
12 Packing material & Accessories(CX500T1/T3)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	SPAKA7035SCZZ	AT		D	Packing add	
2	SPAKA7044SCZZ	AU		D	Packing add	
3	TLABZ7029SCZZ	AQ		C	Label,inst.	[CX500T1]
	TLABZ7051SCZZ	AK		C	Label,inst.	[CX500T3]
4	LPLTP7027SCZZ	BA		C	Plate,dispersion	[CX500T1]
	LPLTP7045SCZZ	BA		C	Plate,dispersion	[CX500T3]
5	SPAKC7034SCZZ	AY		D	Packing case	[CX500T1]
	SPAKC7048SCZZ	AN		D	Packing case	[CX500T3]
6	TCAUH7003SCZZ	AC		C	Label,caution	
7	LPLTP7034SCZZ	AW		C	WB plate 1	[CX500T1]
	LPLTP7046SCZZ	AW		C	WB plate 1	[CX500T3]
8	LPLTP7035SCZZ	AW		C	WB plate 2	[CX500T1]
	LPLTP7047SCZZ	AW		C	WB plate 2	[CX500T3]
9	LPLTP7036SCZZ	AW		C	WB plate 3	[CX500T1]
	LPLTP7048SCZZ	AW		C	WB plate 3	[CX500T3]
10	SPAKP7046SCZZ	AS		C	Vinyl bag	
11	SSAKH0021SCZZ	AC		C	Vinyl bag	
12	JHNDP7002SCZZ	AE		C	Handle,table	
13	PSHEZ7036SCZZ	AH		C	Sheet,shield	[CX500T1]
	PSHEZ7044SCZZ	AH		C	Sheet,shield	[CX500T3]
14	SSAKA0003HCZZ	AA		C	Vinyl bag	

11 Packing material & Accessories



12 Packing material & Accessories(CX500T1/T3)



13 CCD board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C1]
2	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C2]
3	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C3]
4	VCKYPU1HB471K	AA		C	Capacitor (50WV 470pF)	[C4]
5	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C5]
6	VCEAAU1HW335Q	AB		C	Capacitor (50WV 3.3μF)	[C6]
7	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C7]
8	VCKYPU1HF223Z	AA		C	Capacitor (50WV 22000pF)	[C8]
9	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C9]
10	VCSATU1AE336M	AF		C	Capacitor (10WV 33μF)	[C10]
11	VCSATU1AE336M	AF		C	Capacitor (10WV 33μF)	[C11]
12	VCEAAU1HW335Q	AB		C	Capacitor (50WV 3.3μF)	[C12]
13	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C13]
14	QCNCM7002SC1F	AG		C	Connector (16pin)	[CN1]
15	QPiN-2005SCZZ	AA		C	Pin (0Ω)	[GND]
16	QPiN-2005SCZZ	AA		C	Pin (0Ω)	[OS]
17	VRD-RC2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R1]
18	VRD-RC2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R2]
19	VRD-RC2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R3]
20	VRD-RC2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R4]
21	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R5]
22	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R6]
23	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R7]
24	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R8]
25	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R9]
26	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R10]
27	VRD-RC2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R11]
28	VRD-RC2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R12]
29	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R13]
30	VRD-RC2EY152J	AA		C	Resistor (1/4W 1.5KΩ ±5%)	[R14]
31	VRD-RC2EY621J	AA		C	Resistor (1/4W 620Ω ±5%)	[R15]
32	QPiN-2005SCZZ	AA		C	Pin (0Ω)	[TPOT]
33	QPiN-2005SCZZ	AA		C	Pin (0Ω)	[VO]
34	PSPAZ7002SCZZ	AB		C	Spacer	
35	VHiAM0026CN-1	AQ		B	IC (AM0026CN)	[IC1,2,3]
36	VHiMA7022//-1	AY		B	IC (MA7022)	
37	VHiTCD105C/-1	BU		B	IC (TCD105C)	
38	QCNW-7061SCZZ	AC		C	Earth wire	[USA]
	(Unit)					
901	CPWBN3005SC02	CB		E	CCD PWB unit	[USA]
	CPWBX3066SC01	CC	N	E	CCD PWB unit	[Europe]

14 Control board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR1]
2	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR2]
3	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR3]
4	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR4]
5	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR5]
6	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR6]
7	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR7]
8	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR8]
9	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR9]
10	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR10]
11	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR11]
12	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR12]
13	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR13]
14	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[BR14]
15	VCKYPU1HF223Z	AA		C	Capacitor (50WV 22000pF)	[C1]
16	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C2]
17	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C3]
18	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C4]
19	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C5]
20	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C6]
21	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C7]
22	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C8]
23	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C9]
24	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C10]
25	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C11]
26	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C12]
27	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C13]
28	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C14]
29	VCSATU1AE336M	AF		C	Capacitor (10WV 33μF)	[C15]
30	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C16]
31	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C17]

14 Control board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
32	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C18]
33	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C19]
34	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C21]
35	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C22]
36	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C23]
37	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C24]
38	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C25]
39	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C27]
40	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C28]
41	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C29]
42	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C30]
43	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C31]
44	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C32]
45	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C33]
46	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C34]
47	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C35]
48	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C36]
49	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C37]
50	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C38]
51	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C39]
52	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C40]
53	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C41]
54	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C42]
55	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C43]
56	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C[redacted]
57	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C[redacted]
58	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C46]
59	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C47]
60	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C48]
61	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C49]
62	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C50]
63	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C51]
64	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C52]
65	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C53]
66	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C54]
67	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C55]
68	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C56]
69	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C57]
70	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C58]
71	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C60]
72	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C61]
73	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C63]
74	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C64]
75	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C65]
76	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C66]
77	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C67]
78	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C68]
79	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C69]
80	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C70]
81	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C71]
82	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C72]
83	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C[redacted]
84	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C[redacted]
85	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C75]
86	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C76]
87	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C77]
88	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C78]
89	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C79]
90	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C80]
91	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C81]
92	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C82]
93	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C83]
94	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C84]
95	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C85]
96	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C86]
97	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C87]
98	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C88]
99	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C89]
100	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C90]
101	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C91]
102	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C92]
103	VCKYPU1HB101K	AA		C	Capacitor (50WV 100pF)	[C93]
104	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C95]
105	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C96]
106	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C97]
107	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C98]
108	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C99]
109	VCKYPU1HB101K	AA		C	Capacitor (50WV 100pF)	[C100]
110	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C[redacted]
111	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C[redacted]

14 Control board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
112	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C103]
113	VCCCPU1HH5R0D	AA		C	Capacitor (50WV 5.0pF)	[C104]
114	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C105]
115	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C106]
116	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C107]
117	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C108]
118	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C109]
119	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C110]
120	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C111]
121	VCSATU1AE336M	AF		C	Capacitor (10WV 33μF)	[C112]
122	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C113]
123	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C114]
124	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C115]
125	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C116]
126	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C117]
127	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C118]
128	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C119]
129	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C120]
130	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C121]
131	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C122]
132	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C123]
133	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C124]
134	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C125]
135	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C126]
136	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C127]
137	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C128]
138	VCSATU1EE106M	AE		C	Capacitor (25WV 10μF)	[C129]
139	VCKYPU1HF223Z	AA		C	Capacitor (50WV 22000pF)	[C130]
140	VCSATU1CE226M	AE		C	Capacitor (16WV 22μF)	[C131]
141	VCKYPU1HF223Z	AA		C	Capacitor (50WV 22000pF)	[C132]
142	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C133]
143	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C134]
144	VCTYPU1NX104M	AB		C	Capacitor (12WV 0.10μF)	[C135]
145	VCEAAU1CW226Q	AB		C	Capacitor (16WV 22μF)	[C136]
146	QCNCM6834RC2F	AH		C	Connector (26pin)	[CN1]
147	QCNCM5024SC2J	AH		C	Connector (20pin)	[CN2]
148	QCNCM2303SC1C	AC		C	Connector (13pin)	[CN3]
149	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D1]
150	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D2]
151	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D3]
152	VHD10D1////-1	AD		B	Diode (10D1)	[D4]
153	VHD10D1////-1	AD		B	Diode (10D1)	[D5]
154	RCORF7003SCZZ	AH	N	C	Shield plate (for IC26,IC115,XTAL1)	[Europe]
155	VHiiR9311//-1	AE		B	IC (IR9311)	[IC1]
156	VHiT7407////-C	AF		B	IC (T7407)	[IC2]
157	VHiT7407////-C	AF		B	IC (T7407)	[IC3]
158	VHiALS244//-1	AS		B	IC (ALS244)	[IC4]
159	VHiT7406///-C	AG		B	IC (T7406)	[IC5]
160	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC6]
161	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC7]
162	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC8]
163	VHiSN75161AN1	AY		B	IC (SN75161AN1)	[IC9]
164	VHiSN75160AN1	AY		B	IC (SN75160AN1)	[IC10]
165	VHiUPD8255A-2	AQ		B	IC (UPD8255A)	[IC11]
167	VHiLH232627-1	AR		B	IC (LH232627)	[IC12]
168	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC13]
169	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC14]
170	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC15]
171	VHiTMS9914ANL	BE		B	IC (TMS9914ANL)	[IC16]
172	VHiALS245//-1	AW		B	IC (ALS245)	[IC17]
173	VHiALS244//-1	AS		B	IC (ALS244)	[IC18]
174	VHiLZ92A19/-1	AM		B	IC (LZ92A19)	[IC19]
175	VHiALS04///-1	AG		B	IC (ALS04)	[IC20]
176	VHiALS273//-1	AL		B	IC (ALS273)	[IC21]
177	VHiT74LS14/-C	AG		B	IC (T74LS14)	[IC22]
178	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC24]
179	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC25]
180	VHiSN74S240-1	AW		B	IC (SN74S240)	[IC26]
181	VHiALS32////-1	AG		B	IC (ALS32)	[IC27]
182	VHiALS244//-1	AS		B	IC (ALS244)	[IC28]
183	VHiALS32////-1	AG		B	IC (ALS32)	[IC29]
184	VHiALS374//-1	AR		B	IC (ALS374)	[IC30]
185	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC31]
186	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC32]
187	VHiALS161//-1	AH		B	IC (ALS161)	[IC35]
188	VHiALS00///-1	AG		B	IC (ALS00)	[IC36]
189	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC37]
190	VHiALS244//-1	AS		B	IC (ALS244)	[IC38]
191	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC39]
192	VHiALS245//-1	AW		B	IC (ALS245)	[IC40]

14 Control board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
193	VHiALS04///-1	AG		B	IC (ALS04)	[IC41]
194	VHiALS00///-1	AG		B	IC (ALS00)	[IC42]
195	VHiALS161//-1	AH		B	IC (ALS161)	[IC43]
196	VHiALS08///-1	AG		B	IC (ALS08)	[IC44]
197	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC45]
198	VHiALS374//-1	AR		B	IC (ALS374)	[IC46]
199	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC47]
200	VHiALS32///-1	AG		B	IC (ALS32)	[IC48]
201	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC49]
202	VHiALS161//-1	AH		B	IC (ALS161)	[IC50]
203	VHiALS32///-1	AG		B	IC (ALS32)	[IC51]
204	VHiLZ92A19/-1	AM		B	IC (LZ92A19)	[IC52]
205	VHiALS244//-1	AS		B	IC (ALS244)	[IC53]
206	VHiLZ92A19/-1	AM		B	IC (LZ92A19)	[IC54]
207	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC55]
208	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC56]
209	VHiALS374//-1	AR		B	IC (ALS374)	[IC57]
210	VHiALS161//-1	AH		B	IC (ALS161)	[IC58]
211	VHiALS161//-1	AH		B	IC (ALS161)	[IC59]
212	VHiALS161//-1	AH		B	IC (ALS161)	[IC60]
213	VHiALS244//-1	AS		B	IC (ALS244)	[IC61]
214	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC62]
215	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC63]
216	VHiALS32///-1	AG		B	IC (ALS32)	[IC64]
217	VHiALS244//-1	AS		B	IC (ALS244)	[IC[redacted]
218	VHiALS32///-1	AG		B	IC (ALS32)	[IC[redacted]
219	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC67]
220	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC68]
221	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC69]
222	VHiALS374//-1	AR		B	IC (ALS374)	[IC70]
223	VHiT74LS283-C	AG		B	IC (T74LS283)	[IC71]
224	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC72]
225	VHiALS04///-1	AG		B	IC (ALS04)	[IC73]
226	VHiALS374//-1	AR		B	IC (ALS374)	[IC74]
227	VHiT74LS283-C	AG		B	IC (T74LS283)	[IC75]
228	VHiALS244//-1	AS		B	IC (ALS244)	[IC76]
229	VHiTMM2068D55	AX		B	IC (TMM2068D55)	[IC77]
230	VHiTMM2068D55	AX		B	IC (TMM2068D55)	[IC78]
231	VHiALS74///-1	AK		B	IC (ALS74)	[IC79]
232	VHiT74LS283-C	AG		B	IC (T74LS283)	[IC80]
233	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC81]
234	VHiALS374//-1	AR		B	IC (ALS374)	[IC83]
235	VHiT74LS283-C	AG		B	IC (T74LS283)	[IC84]
236	VHiALS273//-1	AL		B	IC (ALS273)	[IC85]
237	VHiUPD8041271	AR		B	IC (UPD8041271)	[IC86]
238	VHiALS04///-1	AG		B	IC (ALS04)	[IC87]
239	VHiALS374//-1	AR		B	IC (ALS374)	[IC88]
240	VHiALS245//-1	AW		B	IC (ALS245)	[IC91]
241	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC92]
242	VHiALS32///-1	AG		B	IC (ALS32)	[IC93]
243	VHiALS161//-1	AH		B	IC (ALS161)	[IC[redacted]
244	VHiALS374//-1	AR		B	IC (ALS374)	[I[redacted]
245	VHiALS374//-1	AR		B	IC (ALS374)	[IC[redacted]
246	VHiLH235765-1	AT		B	IC (LH235765)	[IC97]
247	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC98]
248	VHiALS374//-1	AR		B	IC (ALS374)	[IC99]
249	VHiALS374//-1	AR		B	IC (ALS374)	[IC100]
250	VHiALS161//-1	AH		B	IC (ALS161)	[IC101]
251	VHiALS374//-1	AR		B	IC (ALS374)	[IC102]
252	VHiT74LS283-C	AG		B	IC (T74LS283)	[IC103]
253	VHiLZ92A19/-1	AM		B	IC (LZ92A19)	[IC104]
254	VHiALS138//-1	AM		B	IC (ALS138)	[IC105]
255	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC106]
256	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC107]
257	VHiALS374//-1	AR		B	IC (ALS374)	[IC109]
258	VHiT74LS283-C	AG		B	IC (T74LS283)	[IC110]
259	VHiALS374//-1	AR		B	IC (ALS374)	[IC111]
260	VHiDQ2816A250	AY		B	IC (DQ2816A250)	[IC112]
261	VHiALS138//-1	AM		B	IC (ALS138)	[IC113]
262	VHiALS32///-1	AG		B	IC (ALS32)	[IC114]
263	VHiSN74S04N-1	AG		B	IC (SN74S04N)	[IC115]
264	VHiALS74///-1	AK		B	IC (ALS74)	[IC116]
265	VHiALS245//-1	AW		B	IC (ALS245)	[IC117]
266	VHiALS374//-1	AR		B	IC (ALS374)	[IC118]
267	VHiALS244//-1	AS		B	IC (ALS244)	[IC119]
268	VHiALS138//-1	AM		B	IC (ALS138)	[IC120]
269	VHiALS08///-1	AG		B	IC (ALS08)	[IC121]
270	VHiALS10///-1	AG		B	IC (ALS10)	[IC[redacted]
271	VHiALS00///-1	AG		B	IC (ALS00)	[IC[redacted]
272	VHiLZ92A19/-1	AM		B	IC (LZ92A19)	[IC[redacted]

14 Control board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
273	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC125]
274	VHiALS374//-1	AR		B	IC (ALS374)	[IC126]
275	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC127]
276	VHiALS02///-1	AE		B	IC (ALS02)	[IC128]
277	VHiT7407///-C	AF		B	IC (T7407)	[IC129]
278	VHiT74LS164-C	AG		B	IC (T74LS164)	[IC130]
279	VHiALS245//-1	AW		B	IC (ALS245)	[IC131]
280	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC133]
281	VHiALS374//-1	AR		B	IC (ALS374)	[IC134]
282	QSOCZ6428ACZZ	AE		C	IC socket (28pin)	[IC135]
283	VHi27128S011E	BK		B	IC (27128S011E)	[IC135]
284	VHiALS245//-1	AW		B	IC (ALS245)	[IC136]
285	VHiALS04///-1	AG		B	IC (ALS04)	[IC137]
286	VHiALS04///-1	AG		B	IC (ALS04)	[IC138]
287	VHiALS374//-1	AR		B	IC (ALS374)	[IC139]
288	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC140]
289	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC141]
290	VHiALS32///-1	AG		B	IC (ALS32)	[IC142]
291	VHiT74LS670-C	AL		B	IC (T74LS670)	[IC143]
292	VHiLH235765-1	AT		B	IC (HL235765)	[IC144]
293	VHiALS32///-1	AG		B	IC (ALS32)	[IC145]
294	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC146]
295	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC147]
296	VHiALS244//-1	AS		B	IC (ALS244)	[IC148]
297	VHiALS244//-1	AS		B	IC (ALS244)	[IC149]
298	VHiALS32///-1	AG		B	IC (ALS32)	[IC150]
299	VHiT74LS670-C	AL		B	IC (T74LS670)	[IC151]
300	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC152]
301	VHiALS373//-1	AK		B	IC (ALS373)	[IC153]
302	VHiALS244//-1	AS		B	IC (ALS244)	[IC154]
303	VHiALS11///-1	AD		B	IC (ALS11)	[IC155]
304	VHiALS244//-1	AS		B	IC (ALS244)	[IC156]
305	VHiLZ91B16/-1	AW		B	IC (LZ91B16)	[IC157]
306	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC157]
307	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC158]
308	VHiiR9K08//-1	AH		B	IC (IR9K08)	[IC159]
309	VHiLH0080B/-1	BH		B	IC (LH0080B)	[IC161]
310	VHiALS04///-1	AG		B	IC (ALS04)	[IC162]
311	VHiALS244//-1	AS		B	IC (ALS244)	[IC163]
312	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC164]
313	VHiTL082///-1	AK		B	IC (TL082)	[IC165]
314	VHiUPD8253C-2	AR		B	IC (UPD8253C)	[IC166]
315	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC168]
316	VHiiR9K08//-1	AH		B	IC (IR9K08)	[IC169]
317	VHiLM318///-1	AW		B	IC (LM318)	[IC170]
318	VHiUPD8257/-2	AT		B	IC (UPD8257)	[IC171]
319	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC172]
320	VHiT74LS157-C	AF		B	IC (T74LS157)	[IC173]
321	VHiiR3K04//-1	BE		B	IC (IR3K04)	[IC174]
322	VHiUPD8253C-2	AR		B	IC (UPD8253C)	[IC175]
323	VHiALS04///-1	AG		B	IC (ALS04)	[IC176]
324	VHiHM6264ASP1	AW		B	IC (HM6264ASP1)	[IC176]
325	VHiALS27///-1	AG		B	IC (ALS27)	[IC177]
326	VHiUPD8255A-2	AQ		B	IC (UPD8255A)	[IC178]
327	VHiALS00///-1	AG		B	IC (ALS00)	[IC179]
328	VHiALS00///-1	AG		B	IC (ALS00)	[IC180]
329	VHiLM310N//-1	AS		B	IC (LM310N)	[IC181]
330	VHiTC5093AP-1	AW		B	IC (TC5093AP)	[IC182]
331	VHiT7406///-C	AG		B	IC (T7406)	[IC183]
332	VHiUPD8253C-2	AR		B	IC (UPD8253C)	[IC184]
333	VHiUPD8041271	AR		B	IC (UPD8041271)	[IC185]
334	VHiMA7021//-1	AX		B	IC (MA7021)	[IC186]
335	VHiALS08///-1	AG		B	IC (ALS08)	[IC187]
336	VHiALS04///-1	AG		B	IC (ALS04)	[IC188]
337	VHiALS27///-1	AG		B	IC (ALS27)	[IC189]
338	VHiALS10///-1	AG		B	IC (ALS10)	[IC190]
339	VHiT7406///-C	AG		B	IC (T7406)	[IC191]
340	VHiT7406///-C	AG		B	IC (T7406)	[IC192]
341	VHiiR9393//-1	AE		B	IC (IR9393)	[IC193]
342	VHiALS32///-1	AG		B	IC (ALS32)	[IC194]
343	VHiALS04///-1	AG		B	IC (ALS04)	[IC195]
344	VHiALS32///-1	AG		B	IC (ALS32)	[IC196]
345	VHiT7406///-C	AG		B	IC (T7406)	[IC197]
346	VHiNJM79M06-1	AK		B	IC (NJM79M06)	[IC198]
347	RCiLZ7004SCZZ	AE		C	Coil	[L1] (BF503D-00) [Europe]
348	VS2SA673A//-1	AD		B	Transistor (2SA673A)	[Q1]
349	VS2SD1195-//-1	AH		B	Transistor (2SD1195)	[Q2]
350	VS2SD1207-T-1	AD		B	Transistor (2SD1207-T)	[Q3]
351	VS2SA673A//-1	AD		B	Transistor (2SA673A)	[Q4]
352	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R1]

14 Control board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
353	VRD-RC2EY223J	AA		C	Resistor (1/4W 22KΩ ±5%)	[R2]
354	VRD-RC2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R3]
355	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R4]
356	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R5]
357	VRD-RC2EY333J	AA		C	Resistor (1/4W 33KΩ ±5%)	[R6]
358	VRD-RC2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R7]
359	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R8]
360	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R9]
361	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R10]
362	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R11]
363	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R12]
364	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R13]
365	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R14]
366	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R15]
367	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R16]
368	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R17]
369	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R18]
370	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R19]
371	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R20]
372	VRD-RC2EY104J	AA		C	Resistor (1/4W 100KΩ ±5%)	[R21]
373	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R22]
374	VRD-RC2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R23]
375	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R24]
376	VRD-RC2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R25]
377	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R]
378	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[
379	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R28]
380	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R29]
381	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R30]
382	VRD-RC2EY102J	AA		C	Resister (1/4W 1KΩ ±5%)	[R31]
383	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R32]
384	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R33]
385	VRNHT2EK3301F	AA		C	Resistor (1/4W 3.3KΩ ±1%)	[R34]
386	VRD-RC2EY102J	AA		C	Resister (1/4W 1KΩ ±5%)	[R35]
387	VRNHT2EK3301F	AA		C	Resistor (1/4W 3.3KΩ ±1%)	[R36]
388	VRNHT2EK1001F	AA		C	Resistor (1/4W 1KΩ ±1%)	[R37]
389	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R38]
390	VRNHT2EK3301F	AA		C	Resistor (1/4W 3.3KΩ ±1%)	[R39]
391	VRD-RC2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R40]
392	VRNHT2EK3301F	AA		C	Resistor (1/4W 3.3KΩ ±1%)	[R41]
393	VRD-RC2EY222J	AA		C	Resistor (1/4W 2.2KΩ ±5%)	[R42]
394	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R43]
395	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R44]
396	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R45]
397	VRD-RC2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R46]
398	VRD-RC2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R47]
399	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R48]
400	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R49]
401	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R50]
402	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R51]
403	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R52]
404	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[
405	VRD-RC2EY102J	AA		C	Resister (1/4W 1KΩ ±5%)	[
406	VRNHT2EK1001F	AA		C	Resistor (1/4W 1KΩ ±1%)	[R55]
407	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R56]
408	VRD-RC2EY122J	AA		C	Resistor (1/4W 1.2KΩ ±5%)	[R57]
409	VRD-RC2EY122J	AA		C	Resistor (1/4W 1.2KΩ ±5%)	[R58]
410	VRD-RC2EY122J	AA		C	Resistor (1/4W 1.2KΩ ±5%)	[R59]
411	VRD-RC2EY122J	AA		C	Resistor (1/4W 1.2KΩ ±5%)	[R60]
412	VRD-RC2EY122J	AA		C	Resistor (1/4W 1.2KΩ ±5%)	[R61]
413	VRD-RC2EY122J	AA		C	Resistor (1/4W 1.2KΩ ±5%)	[R62]
414	VRNHT2EK3300F	AA		C	Resistor (1/4W 330Ω ±1%)	[R63]
415	VRNHT2EK56R0F	AA		C	Resistor (1/4W 56Ω ±1%)	[R64]
416	VRD-RC2EY102J	AA		C	Resister (1/4W 1KΩ ±5%)	[R65]
417	VRD-RC2EY104J	AA		C	Resistor (1/4W 100KΩ ±5%)	[R66]
418	VRD-RC2EY102J	AA		C	Resister (1/4W 1KΩ ±5%)	[R67]
419	VRD-RC2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R68]
420	VRD-RC2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R69]
421	VRD-RC2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R70]
422	VRD-RC2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R71]
423	VRD-RC2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R72]
424	QSW-Z2331RCZZ	AM		B	Dip switch (2point)	[T-SW]
425	VHH103AT-2/-1	AG		B	Thermistor (103AT-2)	[TH1]
426	VRD-ST2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[TPAG]
427	VRD-ST2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[TPAG]
428	VRD-ST2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[TPDG]
429	VRD-ST2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[TPOS]
430	VRD-ST2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[TPSB]
431	VRD-ST2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[T
432	VRD-ST2EY000J	AA		C	Resistor (1/4W 0Ω ±5%)	[T.

14 Control board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
433	RCRSQ2012HCZZ	AT		B	Crystal (20MHz) [X1]
434	VHERD6 8E//-1	AB		B	Zener diode (RD6.8E) [ZD1]
435	VHERD4 3EB2-1	AB		B	Zener diode (RD4.3EB2) [ZD2]
436	VHERD4 3EB2-1	AB		B	Zener diode (RD4.3EB2) [ZD3]
437	LP,NS4011CCZZ	AB		C	Pin
438	MLEVP2001SCZZ	AC		C	Lever
	(Unit)				
901	DUNTK7803SCZZ	**	N	E	Control board [USA]
	DUNTK7816SCZZ	**	N	E	Control board [Europe]

15 Power supply unit (USA)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
⚠ 1	0CB129890116/	AW		B	Transformer (ST-020) [T1]
⚠ 2	0CB130890018/	AX		B	Transformer (PT-N08) [T2]
⚠ 3	0CB129800026/	AQ		B	Transformer (DT-23) [T3,4]
⚠ 4	0CB129820002/	AN		B	Transformer (DT-25) [T5]
5	0CBUKZ0022ZZ/	AR		C	Choke coil (SC-05-100) [L1]
6	0CBUKZ0101ZZ/	AN		C	Choke coil (SN-10-500) [L2,3]
7	0CB129890118/	AT		C	Choke coil (FC-021) [L4]
8	0CBUKZ0049ZZ/	AG		C	Choke Coil (SBC-02) [L5,7]
9	0CB130890017/	AT		C	Choke Coil (CH-040) [L8]
10	0CBUCZ0097ZZ/	AG		B	IC (M5237L) [IC1]
11	0CBUCH0036ZZ/	AW		B	IC (FX071) [IC2]
12	0CBUCH0017ZZ/	AX		B	IC (MA2129) [IC3]
13	0CBUDC0009BZ/	AP		B	Optical Isolator (PS2401-2) [PC1]
14	VHS2P4MCY//-1	AL		B	Thyristor (2P4MCY) [SCR1]
15	VS2SC3259-/-1	AL		B	Transistor (2SC3259) [Q1]
16	0CBUAC0117AZ/	AT		B	Transistor (2SC3833) [Q6,7]
17	0CBUAC0142AZ/	AL		B	Transistor (2SC3747) [Q10]
18	0CBUAC0078CZ/	AG		B	Transistor (2SC2061) [Q3,8,9]
19	VS2SC945///-1	AD		B	Transistor (2SC945) [Q2,5]
20	0CBUAB0038DZ/	AK		B	Transistor (2SB1274Q) [Q4]
21	0CBUBB0087SZ/	AN		B	Diode (D5SB60S) [D1]
22	0CBUBC0130AA/	AG		B	Diode (RU2B) [D2]
23	0CBUBC0147BZ/	AD		B	Diode (DFC03J) [D3,5]
24	0CBUBA0004AZ/	AB		B	Diode (1SS53) [D4,11,12,13,14]
25	0CBUBC0152AZ/	AE		B	Diode (EL1Z) [D6,7]
26	0CBUBC0129AA/	AF		B	Diode (EG01) [D9,10]
27	0CBUBB0133BZ/	AN		B	Diode (FML22S) [D15]
28	0CBUBB0107BZ/	AL		B	Diode (D5S4M) [D16]
29	0CBUBA0005AZ/	AC		B	Diode (1SS55) [D18]
30	VHERD6 2EB2-1	AB		B	Zener diode (RD6.2EB2) [D8,20]
31	0CBUBD0124CZ/	AD		B	Zener diodo (RD12EB2) [D21]
32	0CBUBD0133DZ/	AD		B	Diode (RD27EB3) [D19]
33	0CBUGZ0549ZZ/	AU		C	Capacitor (LLR2D561MHSB) [C8,9]
34	0CBUGAZR47AY/	AE		C	Chemical capacitor (500WV 0.47μF) [C10]
35	0CBUGAF470BU/	AE		C	Capacitor (UVX1H470MPA) [C14]
36	0CBUGAE222BU/	AK		C	Capacitor (UVX1V222MHA) [C41]
37	0CBUGAE102BU/	AF		C	Chemical capacitor (35WV 1000μF) [C36,40]
38	0CBUGAE100BU/	AC		C	Capacitor (UVX1V100MAA) [C31,48,49]
39	0CBUGAD471MPA	AE		C	Capacitor (UVX1E471MPA) [C16,17,22]
40	0CBUGAD101BU/	AD		C	Capacitor (UVX1E101MPA) [C20]
41	0CBUGAC331BU/	AD		C	Chemical capacitor (16WV 330μF) [C23]
42	0CBUGAB221BU/	AD		C	Chimical capacitor (220μ/10V) [C32]
43	0CBUGAB222BU/	AG		C	Chemical capacitor (10WV 2200μF) [C44,45]
44	0CBUGZ0297ZZ/	AN		C	Capacitor (250WV 2.2μF) [C26]
45	0CBUGZ0480ZZ/	AG		C	Capacitor (LHX250VAC473M) [C1,2]
46	0CBUGFF104AR/	AD		C	Capacitor (AMZ-104K50) [C13]
47	0CBUGCZ472AE/	AE		C	Capacitor (DE7100FZ472PVA1) [C3,4,5]
48	0CBUGCQ102AB/	AC		C	Capacitor (DE7090B102KVA1) [C6,7]
49	0CBUGCZ103AD/	AC		C	Ceramic capacitor (0.01μF/500V) [C35,38,39,50]
50	0CBUGCZ222AA/	AC		C	Ceramic capacitor (2200pF/500V) [C33,34]
51	0CBUGCZ221AA/	AB		C	Capacitor (DD05B221K500V) [C27,28]
52	0CBUGCZ471AA/	AB		C	Capacitor (500WV 470pF) [C11,12]
53	0CBUGCF104AS/	AD		C	Ceramic capacitor (0.1μF/50V) [C37]
54	0CBUGCF103AJ/	AB		C	Ceramic capacitor (50WV 0.01μF) [C15,21,24,29,30,43,47]
55	0CBUGCF332AD/	AB		C	Capacitor (DD107B332K50V) [C25]
56	0CBUGCF102AD/	AB		C	Capacitor (DD104B102K50V) [C42]
57	0CBUGCF104AR/	AC		C	Capacitor (DD308F104Z25V) [C18,19]
58	0CBUEFF683AE/	AE		C	Resistor (MOS3J683) [R6]
59	0CBUEFE102AN/	AD		C	Resistor (MOS2J102) [R25]
60	0CBUEFE184AH/	AC		C	Resistor (RSF2P184J) [R4]
61	0CBUEFD1R2AS/	AC		C	Resistor (RSF1P1R2J) [R7]
62	0CBUECC564AB/	AB		C	Resistor (RCY-564K UL)(1/2W 560KΩ) [R1]
63	VRD-ST2HY560J	AB		C	Resistor (1/2W 56Ω ±5%) [R5]

15 Power supply unit (USA)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
64	VRD-ST2HY121J	AB		C	Resistor (1/2W 120Ω ±5%)	[R49]
65	VRD-ST2EY102J	AA		C	Resister (1/4W 1KΩ ±5%)	[R28,29,39,40,46]
66	VRD-ST2HY104J	AA		C	Resistor (1/2W 100KΩ ±5%)	[R2,3]
67	VRD-ST2HY223J	AA		C	Resistor (1/2W 22KΩ ±5%)	[R17]
68	VRD-ST2EY153J	AA		C	Resistor (1/4W 15KΩ ±5%)	[R9]
69	VRD-ST2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R36,51]
70	VRD-ST2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R22,53,54]
71	VRD-ST2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R23]
72	VRD-ST2EY222J	AA		C	Resistor (1/4W 2.2KΩ ±5%)	[R21,37,55]
73	VRD-ST2EY182J	AA		C	Resistor (1/4W 1.8KΩ ±5%)	[R18]
74	VRD-ST2EY122J	AA		C	Resistor (1/4W 1.2KΩ ±5%)	[R38,50]
75	VRD-ST2EY102J	AA		C	Resister (1/4W 1KΩ ±5%)	[R15,20,34,35]
76	VRD-ST2EY561J	AA		C	Resistor (1/4W 560Ω ±5%)	[R30,31]
77	VRD-ST2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R13,19]
78	VRD-ST2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)	[R8,12,14]
79	VRD-ST2EY151J	AA		C	Resistor (1/4W 150Ω ±5%)	[R16,24,44]
80	VRD-ST2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R26,27,32,33]
81	VRD-ST2EY680J	AA		C	Resistor (1/4W 68Ω ±5%)	[R10]
82	VRD-ST2EY220J	AA		C	Resistor (1/4W 22Ω ±5%)	[R42,52]
83	VRD-ST2EY180J	AA		C	Resistor (1/4W 18Ω ±5%)	[R45]
84	VRD-ST2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R11]
85	VRD-ST2EY822J	AA		C	Resistor (1/4W 8.2KΩ ±5%)	[R41]
86	0CBUFZ0089BZ/	AE		B	Volume (VZ067TL1B501)	[VR2]
87	0CBUFBA201AA/	AE		B	Volume (VZ067TL1B201)	[VR1]
88	0CBUFZ0082ZZ/	AE		B	Volume (VZ067TL1B102)	[VR]
⚠ 89	0CBPJT0106ZZ/	AH		A	Theamal Cotoff (SF96U)	
⚠ 90	0CBPJC0370ZZ/	AF		A	Fuse (SB-3.15A)	[F1]
⚠ 91	0CBPJC0298ZZ/	AG		A	Fuse (2A 125V)	[F4,5]
⚠ 92	0CBPJC0303ZZ/	AE		A	Fuse (GGS-315mA)	[F3]
93	0CBUCZ0130ZZ/	AG		C	IC Protector (ICP-N50)	[ICP1]
	(Unit)					
901	DUNTK7055SCZZ	CD		E	Power supply unit	[USA]

16 Power supply unit (Europe)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	0CB829690104/	AW	N	B	Transformer (ST-P25-KT)	[T1]
2	0CB830690040/	AZ	N	B	Transformer (PT-P16-KT)	[T2]
3	0CB829820149/	AR		B	Transformer (DT-P09-KT)	[T3]
4	0CB829820101/	AN		B	Transformer (DT-25-KT)	[T5]
5	0CB829690103/	AW	N	C	Choke coil (FC-42-KT)	[L1]
6	0CBUKZ0105ZZ/	AL	N	C	Choke coil (SN10-500T)	[L2,3]
7	0CBUKZ0072ZZ/	AY		C	Choke coil (SC-02-300JV)	[L4]
8	0CBUKZ0049ZZ/	AG		C	Choke Coil (SBC-02)	[L5,7]
9	0CB830810009/	AZ	N	C	Choke Coil (CH-099)	[L6]
10	0CB829820128/	AU		C	Choke coil (CH-067-KT)	[L8]
11	0CBUAC0190AZ/	AP	N	B	Transistor (1SC3531)	[Q1]
12	0CBUAC0156AZ/	AC		B	Transistor (2SC536SP)	[Q]
13	0CBUAD0039AZ/	AG		B	Transistor (2SD734)	
14	0CBUAC0078CZ/	AG		B	Transistor (2SC2061-Q)	[Q3,8,9]
15	0CBUAB0038DZ/	AK		B	Transistor (2SB1274Q)	[Q4]
16	0CBUAC0117AZ/	AT		B	Transistor (2SC3833)	[Q6,7]
17	0CBUAC0142AZ/	AL		B	Transistor (2SC3747)	[Q10]
18	0CBUBB0149DZ/	AH	N	B	Diode stac (D3SBA60)	D1]
19	0CBUBA0022EZ/	AC		B	Diode (DFD05TJ)	[D2]
20	0CBUBA0004AZ/	AB		B	Diode (1SS53)	[D3,4 1 1,12,13,14]
21	0CBUBA0022CZ/	AD		B	Diode (DFD05TE)	[D5,22]
22	0CBLBC0152AZ/	AE	N	B	Diode (EL1Z)	[D6,7]
23	VHERD6.2EB2-1	AB		B	Zener diode (RD6.2EB2)	[D8,20]
24	0CBUBC0129AA/	AF		B	Diode (EG01)	[D9,10]
25	0CBUBB0141AZ/	AM		B	Diode (D10LCA20)	[D15]
26	0CBUBB0107BZ/	AL		B	Diode (D5S4M)	[D16]
27	0CBUBA0005AZ/	AC		B	Diode (1SS55)	[D18]
28	0CBUBD0133DZ/	AD		B	Diode (RD27EB3)	[D19]
29	0CBUBD0124CZ/	AD		B	Zener diode (RD12EB2)	[D21]
30	VHS2P4MCY//-1	AL		B	Thyristor (2P4M-CY)	[SCR1]
31	0CBUCZ0097ZZ/	AG		B	IC (M5237L)	[IC1]
32	0CBUCH0036ZZ/	AW		B	IC (FX071)	[IC2]
33	0CBUCH0017ZZ/	AX		B	IC (MA2129)	[IC3]
34	0CBUGFM224BA/	AR		C	Film Capacitor (B81121-CB127)	[C1]
35	0CBUGCQ222AB/	AE		C	Capacitor (DE7100F222MVA1)	[C2,3,5]
36	0CBUGFM474BA/	AK	N	C	Film capacitor (B81121-CB129)	[C4]
37	0CBUGBQ331AF/	AW	N	C	Chemical capacitor (LLK2G331MHSC)	[C6]
38	0CBUGAZR47AV/	AG	N	C	Chemical capacitor (UHU2HR47TPA)	[C]
39	0CBUGCZ471AA/	AB		C	Ceramic capacitor (DD05B471K500V)	[C1]
40	0CBUGFF104AR/	AD		C	Capacitor (AMZ-104K50)	[C]

16 Power supply unit (Europe)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
41	0CBUGAF470BU/	AE		C	Capacitor (UVX1H470MPA)	[C14]
42	0CBUGCF103BR/	AB		C	Ceramic capacitor (DD806F103Z50)	[C15,21,24,29,30,43,47]
43	0CBUGAD101BU/	AD		C	Capacitor (UVX1E101MPA)	[C16,20]
44	0CBUGAD471BU/	AF		C	Chemical capacitor (470μF/25V)	[C17,22]
45	0CBUGCF104AR/	AC		C	Capacitor (DD308F104Z25V)	[C19,46]
46	0CBUGAC331BU/	AD		C	Chemical capacitor (16WV 330μF)	[C23]
47	0CBUGCF332BN/	AB		C	Ceramic capacitor (DD807B332K50)	[C25]
48	0CBUGZ0297ZZ/	AN		C	Capacitor (250WV 2.2μF)	[C26]
49	0CBUGCZ221AA/	AB		C	Capacitor (DD05B221K500V)	[C27,28]
50	0CBUGAE100BU/	AC		C	Chemical capacitor (UVX1V100MAA)	[C31,48,49]
51	0CBUGAB221BU/	AD		C	Chemical capacitor (UVX1A221MPA)	[C32]
52	0CBUGCZ222AA/	AC		C	Ceramic capacitor (2200pF/500V)	[C33,34,51]
53	0CBUGCZ103AD/	AC		C	Ceramic capacitor (0.01μF/500V)	[C35,38,39,50]
54	0CBUGAE102BU/	AF		C	Chemical capacitor (UVX1V102MHA)	[C36,40]
55	0CBUGCF104AS/	AD		C	Ceramic capacitor (0.1μF/50V)	[C37]
56	0CBUGAE222BU/	AK		C	Chemical capacitor (UVX1V22MHA)	[C41]
57	0CBUGZ0238ZZ/	AB	N	C	Ceramic capacitor (DD107E471P50V)	[C42]
58	0CBUGAB222BU/	AG		C	Chemical capacitor (UVX1A222MHA)	[C44,45]
59	VRD-HT2HY564J	AA	N	C	Resistor (1/2W 560KΩ ±5%)	[R1]
60	VRD-HT2HY394J	AA		C	Resistor (1/2W 390KΩ ±5%)	[R2]
61	0CBUEFE184AH/	AC		C	Metal film resistor (RSF2P184J)	[R4]
62	VRD-HT2HY560J	AA		C	Resistor (1/2W 56Ω)	[R5]
63	0CBUEFF683AH/	AC	N	C	Metal film resistor (RR3FS683J)	[R6]
64	0CBUEFD1R2AS/	AC		C	Resistor (RSF1P1R2J)	[R7,12]
65	VRD-HT2EY221J	AA		C	Carbon resistor (R1/4PT221J)	[R8,14]
66	VRD-HT2EY153J	AA		C	Resistor (1/4W 15KΩ ±5%)	[R9]
67	VRD-HT2EY680J	AA		C	Resistor (1/4W 68Ω)	[R10]
68	VRD-HT2EY100J	AA		C	Resistor (1/4W 10Ω ±5%)	[R11]
69	VRD-HT2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R13,19]
70	VRD-HT2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R15,20,34,35]
71	VRD-HT2EY151J	AA		C	Resistor (1/4W 150Ω ±5%)	[R16,24,44]
72	VRD-HT2EY223J	AA		C	Resistor (1/4W 22KΩ ±5%)	[R17,37]
73	VRD-HT2EY182J	AA		C	Resistor (1/4W 1.8KΩ)	[R18]
74	VRD-HT2EY222J	AA		C	Resistor (1/4W 2.2KΩ ±5%)	[R21,42,55]
75	VRD-HT2EY562J	AA		C	Resistor (1/4W 5.6KΩ ±5%)	[R22,54]
76	VRD-HT2EY332J	AA		C	Resistor (1/4W 3.3KΩ ±5%)	[R23]
77	0CBUEFE102AW/	AD		C	Metal oxide film resistor (RS2FS102J)	[R25]
78	VRD-HT2EY101J	AA		C	Resistor (1/4W 100Ω ±5%)	[R26,27,32,33]
79	0CBUEEC2R0AF/	AB		C	Resistor (R1/2PT2R0J)	[R28,29,39,40,46]
80	VRD-HT2EY561J	AA		C	Carbon resistor (R1/4PT561J)	[R30,31]
81	VRD-HT2EY103J	AA		C	Carbon resistor (R1/4PT103J)	[R36,51]
82	VRD-HT2EY122J	AA		C	Carbon resistor (R1/4PT122J)	[R38,50]
83	VRD-HT2EY822J	AA		C	Carbon resistor (R1/4PT822J)	[R41]
84	0CBUEZ0013ZZ/	AA		C	Manganese wire (P1401-3117A)	[R43,48]
85	VRD-HT2EY180J	AA		C	Resistor (1/4W 18Ω ±5%)	[R45]
86	VRD-HT2HY121J	AA		C	Resistor (1/4W 120Ω ±5%)	[R49]
87	VRD-HT2EY220J	AA		C	Resistor (1/4W 22Ω)	[R52]
88	0CBUEFE560AW/	AB	N	C	Metal film resistor (RS2FS560J)	[R56]
89	VRD-HT2HY6R8J	AA	N	C	Resistor (1/2W 6.8Ω ±5%)	[R57]
90	0CBUFBA201CD/	AC	N	B	Variable resistor (RVF6P51-5-201N)	[VR1]
91	0CBUFBA501CD/	AC		B	Variable resistor (RVF6P51-5-501N)	[VR2]
92	0CBUFBA102CD/	AC		B	Variable resistor (RVF6P51-5-102N)	[VR3,4]
⚠ 93	0CBPJC0437ZZ/	AE	N	A	Fuse (EAK 2A 250V)	[F1]
⚠ 94	0CBPJT0115ZZ/	AF		A	Thermal cutoff (U22)	[F2]
⚠ 95	0CBPJC0449ZZ/	AG	N	A	Fuse (EA 3.15MA 250V)	[F3]
⚠ 96	0CBPJC0448ZZ/	AF	N	A	Fuse (EA 2A 250V)	[F4]
⚠ 97	0CBPJC0097ZZ/	AE	N	A	Fuse (GGS2)	[F5]
98	0CBPJP0012ZZ/	AG	N	B	IC protector (ICP-N50)	[ICP1]
99	0CBECD0182ZZ/	AQ	N	C	Housing ass'y (P0457-6002A)	
100	0CBEDD0295ZZ/	AP	N	C	Wire ass'y (D2032-7501A)	
101	0CBLRZ0670ZR/	AD	N	C	Spacer (P0458-5001A)	
102	0CBLRZ0671ZR/	AW	N	C	Heat sink (P0458-5002A)	
103	0CBLRZ0672ZR/	AH	N	C	Heat sink (HS-163)	
104	0CBLRZ0673ZR/	AG	N	C	Heat sink (HS-164)	
105	0CBLRZ0580ZQ/	AC		C	Supporter (SUP-020EZS)	
106	0CBLRZ0297ZQ/	AC	N	C	Angle (P0411-5005A)	
107	0CBPKZ0137ZZ/	AL	N	C	Pin header (350429-1)	
	(Unit)					
901	DUNTK7159SCZZ	CF	N	E	Power supply unit	[Europe]

17 Fluorescent lamp board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	0CBUGAE221BU/	AE		C	Capacitor (UVX1V221MPA)	[C1]
2	0CBUGFQ563BB/	AE		C	Capacitor	[C2]
3	0CBUGZ0460ZZ/	AN		C	Capacitor (DTR473J400V)	[C3]

17 Fluorescent lamp board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
4	0CBUGZ0460ZZ/	AN		C	Capacitor (DTR473J400V)	[C4]
5	0CBUGZ0460ZZ/	AN		C	Capacitor (DTR473J400V)	[C5]
6	0CBUGZ0484ZZ/	AH		C	Capacitor (DKR332H1600V)	[C6]
7	0CBUGZ0484ZZ/	AH		C	Capacitor (DKR332H1600V)	[C7]
8	0CBUGZ0484ZZ/	AH		C	Capacitor (DKR332H1600V)	[C8]
9	0CBUBA0005AZ/	AC		B	Diode (1SS55)	[D1]
10	0CBUBA0005AZ/	AC		B	Diode (1SS55)	[D2]
11	0CBUBA0005AZ/	AC		B	Diode (1SS55)	[D3]
12	0CBUBA0005AZ/	AC		B	Diode (1SS55)	[D4]
⚠ 13	0CBPJC0359ZZ/	AG		A	Fuse (SSFR 3.15A)	[F1]
⚠ 14	0CBPJC0358ZZ/	AG		A	Fuse (SSFR 1.25A)	[F2]
⚠ 15	0CBPJC0257ZZ/	AG		A	Fuse (SSFR 1.0A)	[F3]
⚠ 16	0CBPJC0257ZZ/	AG		A	Fuse (SSFR 1.0A)	[F4]
⚠ 17	0CBPJC0257ZZ/	AG		A	Fuse (SSFR 1.0A)	[F5]
18	0CBUCZ0125ZZ/	AQ		B	IC (TD62064BP)	[IC1]
19	0CBUCZ0125ZZ/	AQ		B	IC (TD62064BP)	[IC2]
20	0CBUKZ0057ZZ/	AK		C	Choke coil (SBC-36)	[L1]
21	0CBUKZ0058ZZ/	AQ		C	Choke coil (SBC-39)	[L2]
22	0CBUKZ0058ZZ/	AQ		C	Choke coil (SBC-39)	[L3]
23	0CBUKZ0058ZZ/	AQ		C	Choke coil (SBC-39)	[L4]
24	0CBUDC0008AZ/	AD		B	LED (GL3AR-1)	[LED]
25	0CBUAB0011DZ/	AM		B	Transistor (2SB826-S)	[Q1]
26	0CBUAB0011DZ/	AM		B	Transistor (2SB826-S)	[Q2]
27	0CBUAB0011DZ/	AM		B	Transistor (2SB826-S)	[Q3]
28	0CBUAB0011DZ/	AM		B	Transistor (2SB826-S)	[ ]
29	0CBUAC0103DZ/	AL		B	Transistor (2SC3568-K)	[ ]
30	0CBUAC0103DZ/	AL		B	Transistor (2SC3568-K)	[Q6]
31	0CBUAC0103DZ/	AL		B	Transistor (2SC3568-K)	[Q7]
32	0CBUAC0103DZ/	AL		B	Transistor (2SC3568-K)	[Q8]
33	0CBUAC0103DZ/	AL		B	Transistor (2SC3568-K)	[Q9]
34	0CBUAC0103DZ/	AL		B	Transistor (2SC3568-K)	[Q10]
35	0CBUAC0103DZ/	AL		B	Transistor (2SC3568-K)	[Q11]
36	0CBUAC0103DZ/	AL		B	Transistor (2SC3568-K)	[Q12]
37	0CBUAC0023CZ/	AC		B	Transistor (2SC1815Y)	[Q13]
38	0CBUAD0029BZ/	AK		B	Transistor (2SD1052A)	[Q14]
39	VRD-ST2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R1]
40	0CBUEFE102AH/	AD		C	Resistor (RSF2P102J)	[R2]
41	VRD-ST2HY272J	AB		C	Resistor (1/2W 2.7KΩ ±5%)	[R3]
42	VRD-ST2HY272J	AB		C	Resistor (1/2W 2.7KΩ ±5%)	[R4]
43	VRD-ST2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R5]
44	0CBUEFE681AH/	AC		C	Resistor (RSF2P681J)	[R6]
45	0CBUEFE102AH/	AD		C	Resistor (RSF2P102J)	[R7]
46	VRD-ST2HY272J	AB		C	Resistor (1/2W 2.7KΩ ±5%)	[R8]
47	VRD-ST2HY272J	AB		C	Resistor (1/2W 2.7KΩ ±5%)	[R9]
48	VRD-ST2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R10]
49	0CBUEFE681AH/	AC		C	Resistor (RSF2P681J)	[R11]
50	0CBUEFE102AH/	AD		C	Resistor (RSF2P102J)	[R12]
51	VRD-ST2HY272J	AB		C	Resistor (1/2W 2.7KΩ ±5%)	[R13]
52	VRD-ST2HY272J	AB		C	Resistor (1/2W 2.7KΩ ±5%)	[R14]
53	VRD-ST2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R15]
54	0CBUEFE681AH/	AC		C	Resistor (RSF2P681J)	[R16]
55	0CBUEFE102AH/	AD		C	Resistor (RSF2P102J)	[ ]
56	VRD-ST2HY272J	AB		C	Resistor (1/2W 2.7KΩ ±5%)	[R18]
57	VRD-ST2HY272J	AB		C	Resistor (1/2W 2.7KΩ ±5%)	[R19]
58	VRD-ST2EY102J	AA		C	Resistor (1/4W 1KΩ ±5%)	[R20]
59	0CBUEFD101AF/	AC		C	Resistor (RSF1P101J)	[R21]
60	VRD-ST2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R22]
61	0CBUEFD101AF/	AC		C	Resistor (RSF1P101J)	[R23]
62	0CBUEFD101AF/	AC		C	Resistor (RSF1P101J)	[R24]
63	VRD-ST2EY100J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R25]
64	VRD-ST2EY100J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R26]
65	VRD-ST2EY100J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R27]
66	VRD-ST2EY100J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R28]
67	VRD-ST2EY100J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R29]
68	VRD-ST2EY100J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R30]
69	VRD-ST2EY100J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R31]
70	VRD-ST2EY100J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R32]
71	0CBUEZ0233ZZ/	AD		C	Resistor (IHR-8-102JA)	[RA]
72	0CB1298101O5/	AX		B	Transformer (OT-030)	[T1]
73	0CB1298101O4/	AX		B	Transformer (OT-022)	[T2]
74	0CB1298101O4/	AX		B	Transformer (OT-022)	[T3]
75	0CB1298101O4/	AX		B	Transformer (OT-022)	[T4]
76	0CBUBD0137EZ/	AC		B	Diode (RD39EB4)	[ZD1]
77	0CBUBD0137EZ/	AC		B	Diode (RD39EB4)	[ZD2]
78	0CBUBD0137EZ/	AC		B	Diode (RD39EB4)	[ZD3]
79	0CBUBD0137EZ/	AC		B	Diode (RD39EB4)	[ZD4]
80	0CBUBD0137EZ/	AC		B	Diode (RD39EB4)	[ZD5]
81	0CBUBD0137EZ/	AC		B	Diode (RD39EB4)	[ZD6]
82	0CBUBD0137EZ/	AC		B	Diode (RD39EB4)	[ZD7]
83	0CBUBD0137EZ/	AC		B	Diode (RD39EB4)	[ZD8]

17 Fluorescent lamp board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
84	QCBUBD0137EZ/	AC		B	Diode (RD39EB4) [ZD9]
85	QCBUBD0137EZ/	AC		B	Diode (RD39EB4) [ZD10]
86	QCBUBD0137EZ/	AC		B	Diode (RD39EB4) [ZD11]
87	QCBUBD0137EZ/	AC		B	Diode (RD39EB4) [ZD12]
88	QCBUBD0137EZ/	AC		B	Diode (RD39EB4) [ZD13]
89	QCBUBD0137EZ/	AC		B	Diode (RD39EB4) [ZD14]
90	QCBUBD0137EZ/	AC		B	Diode (RD39EB4) [ZD15]
91	QCBUBD0137EZ/	AC		B	Diode (RD39EB4) [ZD16]
	(Unit)				
901	DUNTK7031SCZZ	BR		E	Fluorescent lamp actuating PWB

18 Mother board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCM2300SCZZ	AB		C	Connector (2pin)
2	QCNCM2320SC0H	AC		C	Connector (8pin)
3	QCNCM2320SC1E	AD		C	Connector (15pin)
4	QCNCM2322SC0D	AC		C	Connector (4pin)
5	QCNCM2322SC1J	AE		C	Connector (10pin)
6	QCNCM5024SC1F	AG		C	Connector (16pin)
7	QCNCM7003SC0G	AD		C	Connector (7pin)
8	QCNCM7003SC0i	AD		C	Connector (9pin)
9	QCNCW7005SCAJ	AV		C	Connector (100pin)
10	QCNW-7029SCZZ	AC		C	Earth cable [USA]
	QCNW-7087SCZZ	AB	N	C	Earth cable [Europe]
	(Unit)				
901	CPWBN3023SC01	BM		E	Mother board [USA]
	CPWBX3065SC01	BM	N	E	Mother board [Europe]

19 Panel board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCM5022SC2J	AG		C	Connector (20pin)
2	VHPGL4EG5//-1	AB		B	Photo transistor (GL4EG5)
3	VHPGL4HD5//-1	AB		B	Photo transistor (GL4HD5)
	(Unit)				
901	CPWBN3022SC01	BH		E	Panel board unit

20 Address switch board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCM7003SC0G	AD		C	Connector (7pin)
2	QSW-Z7006SCZZ	AN		B	Dip switch (DBS6)
	(Unit)				
901	CPWBE3024SC01	AY		E	Dip switch board

21 Lamp thermistor board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNW-7015SCZZ	AD		C	Cable,thermistor
2	VHH103AT-2/-1	AG		B	Thermistor (103AT-2)
	(Unit)				
901	CPWBE3009SC01	AT		E	Lamp thermistor PWB unit

22 SNS board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNW-7043SCZZ	AG		C	Cable SNS2
2	VCKYPU1HF223Z	AA		C	Capacitor (50WV 22000pF)
3	VHPGP1A14//-1	AK		B	Photo transistor (GP1A14)

22 SNS board

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
4	VRD-RC2EY221J	AA		C	Resistor (1/4W 220Ω ±5%)
	(Unit)				
901	CPWBE3008SC50	AT		E	SNS board unit

50 Hardware parts

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
B01	LX-BZ0124FCZZ	AA		C	Screw
B02	LX-BZ0205FCZZ	AD		C	Screw
B03	LX-BZ1011ACZZ	AA		C	Screw
B06	LX-BZ2073SCZZ	AA		C	Screw (3×8)
B11	LX-BZ7007SCZZ	AB		C	Screw
B12	LX-BZ7008SCZZ	AA		C	Screw
B13	XBPBZ40P06K00	AA		C	Screw (4×6K)
B14	XBPSD30P30000	AA		C	Screw (3×30)
B16	XBPSD30P06KS0	AA		C	Screw (3×6KS)
B18	XCPSD30P06000	AA		C	Screw (3×6)
B19	XBPSD30P08KS0	AA		C	Screw (3×8KS)
B21	XBPSD30P10K00	AA		C	Screw (3×10K)
B27	XBPSD40P06KS0	AA		C	Screw (4×6KS)
B29	XBPSD40P08KS0	AA		C	Screw (4×8KS)
B30	XBPSD40P10KS0	AA		C	Screw (4×10KS)
B32	XBPSD40P14KS0	AA		C	Screw (4×14KS)
B35	XBPSF30P06000	AA		C	Screw (3×6)
B37	XBSSF30P06000	AA		C	Screw (3×6)
B40	XBTSC26P04000	AA		C	Screw (2.6×4)
B42	XBTSF40P06000	AA		C	Screw (4×6)
B44	XBPSD30P06KS0	AA		C	Screw (3×6KS)
B49	XCPSD30P06000	AA		C	Screw (3×6)
B50	XBPSD30P10000	AA		C	Screw (3×10)
B52	XBSSF30P06000	AA		C	Screw (3×6)
B53	XBPSF30P06000	AA		C	Screw (3×6)
B54	XBTSC30P08000	AA		C	Screw (3×8)
B59	LX-BZ4010HC02	AA		C	Screw
B60	LX-BZ0260FCZZ	AA		C	Screw
B61	LX-BZ7010SCZZ	AA		C	Screw
B62	LX-BZ7012SCZZ	AA		C	Screw
B63	LX-BZ7011SCZZ	AA		C	Screw
B64	LX-BZ7016SCZZ	AB		C	Screw (M4×14)
E01	XRESJ20-04000	AA		C	E type ring (2mm)
E03	XRESJ40-06000	AA		C	E type ring (4mm)
E05	XRESJ60-08000	AA		C	E type ring (6mm)
E06	XRESJ70-08000	AA		C	E type ring (7mm)
N01	LX-NZ7001SCZZ	AE		C	Nut
X02	XXXSP30L06000	AA		C	Screw (3×6)
X05	XXXSP40L04000	AA		C	Screw (4×4)
X06	XXXSP40L06000	AB		C	Screw (4×6)
X07	XXXSP40L08000	AB		C	Screw (4×8)

Index

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
[C]					
CANGT7040SC01	4- 7	AH		C	
CARMM7005SC01	6- 14	AK		C	
CCABA7001SC02	2- 2	AX		D	
CCNW-2795SC01	11- 14	AW		B	
CCNW-7032SC01	1- 21	BF		E	
CCNW-7033SC01	1- 32	BB		E	
CCNW-7085SC01	1- 32	BE	N	E	
CCŌVH0135SC03	7- 6	BB		E	
CDA₁-7002SC02	4- 6	BD		C	
CFRM-7010SC01	6- 4	AV		C	
CGLSN7001SC05	1- 1	BU		E	
CHLDZ7011SC01	4- 3	AT		C	
C₁TAU7002SC01	1- 24	BX		C	
C₁TAU7002SC02	1- 24	BX	N	C	
CLMPZ7001SC01	5- 2	BQ		E	
CLNS-7001SC01	8- 1	BU		C	
CPWBE3008SC50	1- 9	AT		E	
〃	22- 901	AT		E	
CPWBE3009SC01	5- 6	AT		E	
〃	21- 901	AT		E	
CPWBE3024SC01	9- 10	AY		E	
〃	20- 901	AY		E	
CPWBN3005SC02	8- 6	CB		E	
〃	13- 901	CB		E	
CPWBN3022SC01	3- 3	BH		E	
〃	19- 901	BH		E	
CPWBN3023SC01	9- 15	BM		E	
〃	18- 901	BM		E	
CPWBX3065SC01	9- 15	BM	N	E	
〃	18- 901	BM	N	E	
CPWBX3066SC01	8- 6	CC	N	E	
〃	13- 901	CC	N	E	
[D]					
DUNTK7031SCZZ	1- 13	BR		E	
〃	17- 901	BR		E	
DUNTK7055SCZZ	1- 507	CD		E	
〃	15- 901	CD		E	
DUNTK7159SCZZ	1- 507	CF	N	E	
〃	16- 901	CF	N	E	
DUNTK7803SCZZ	1- 8	**	N	E	
〃	14- 901	**	N	E	
DUNTK7816SCZZ	1- 8	**	N	E	
〃	14- 901	**	N	E	
DUNTM7118SCZZ	1- 505	CG		E	
〃	8- 901	CG		E	
DUNTM7161SCZZ	1- 505	CG	N	E	
〃	8- 901	CG	N	E	
[G]					
GBŌXD7001SCZZ	5- 4	BK		C	
GCABB7002SCZZ	2- 5	AS		D	
GCABC7003SCZA	2- 1	AQ		D	
GCABC7003SCZC	2- 1	AQ	N	D	
GCABD7004SCZZ	2- 3	AM		D	
GCŌVH0135FCZA	7- 1	AY		C	
GCŌVH0136FCZA	7- 2	AQ		C	
GCŌVH7008SCZZ	1- 2	BD		C	
GCŌVH7014SCZZ	1- 19	BA		C	
GCŌVH7015SCZZ	10- 2	BH		C	
GDA₁-7001SCZZ	4- 2	AF		C	
GDA₁-7003SCZZ	3- 2	AN		C	
GFTAZ7001SCZZ	1- 4	AH		C	
GLEGG2007SCZZ	1- 14	AE		C	
[J]					
JHNDP7002SCZZ	12- 12	AE		C	
[L]					
LANGF7099SCZZ	3- 7	AG		C	
LANGK7069SCZZ	10- 7	AB		C	
LANGT7038SCZZ	9- 2	AF		C	
LANGT7041SCZA	3- 4	BD		C	
LANGT7068SCZZ	1- 33	AM		C	
LANGZ7070SCZZ	10- 1	AU		C	
LBNDJ2003SCZZ	1- 42	AA		C	
LBSHC0096FCZZ	10- 12	AA		C	
LBSHC2019SCZZ	9- 7	AC		C	
LBSHC2020SCZZ	9- 9	AC		C	
LBSHC5020BCZZ	9- 16	AB		C	
LBSHC7004SCZZ	10- 15	AB		C	
LBSHZ2006SCZZ	1- 31	AB		C	
LBSHZ2037SCZZ	5- 3	AD		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
LBSHZ7003SCZZ	1- 16	AD		C	
LFRM-7011SCZZ	10- 8	AP		C	
LFRM-7012SCZZ	10- 13	AV		C	
LHLDF2339RCZZ	9- 8	AB		C	
LHLDW2048SCZZ	9- 5	AB		C	
LHLDW2102SCZZ	5- 5	AB		C	
LHLDW5031BCZZ	9- 6	AA		C	
LHLDW7004SCZA	1- 25	AF		C	
LHLDW7005SCZZ	9- 13	AB		C	
LHLDW7006SCZZ	5- 7	AD		C	
LHLDW7007SCZZ	5- 12	AD		C	
LHLDZ0502FCZZ	7- 4	AV		C	
LHLDZ7009SCZZ	8- 2	AZ		C	
LHLDZ7010SCZZ	8- 4	AY		C	
LHLDZ7015SCZZ	1- 15	AB		C	
LHLDZ7017SCZA	10- 14	BA		C	
LHLDZ7017SCZZ	10- 10	BA		C	
LP₁NS4011CCZZ	14- 437	AB		C	
LPLTM7014SCZA	8- 5	AC		C	
LPLTM7015SCZZ	1- 12	AE		C	
LPLTM7016SCZZ	9- 11	AL		C	
LPLTM7017SCZZ	9- 14	AL		C	
LPLTM7019SCZZ	5- 8	AE		C	
LPLTM7025SCZA	1- 23	AM	N	C	
LPLTM7025SCZZ	1- 23	AH		C	
LPLTM7026SCZZ	1- 22	AC		C	
LPLTP7027SCZZ	12- 4	BA		C	
LPLTP7034SCZZ	12- 7	AW		C	
LPLTP7035SCZZ	12- 8	AW		C	
LPLTP7036SCZZ	12- 9	AW		C	
LPLTP7045SCZZ	12- 4	BA		C	
LPLTP7046SCZZ	12- 7	AW		C	
LPLTP7047SCZZ	12- 8	AW		C	
LPLTP7048SCZZ	12- 9	AW		C	
LRAL-7002SCZZ	9- 3	AF		C	
LSTYM7005SCZZ	9- 1	AQ		C	
LSTYM7007SCZZ	10- 9	AT		C	
LX-BZ0124FCZZ	50-B01	AA		C	
LX-BZ0205FCZZ	50-B02	AD		C	
LX-BZ0260FCZZ	50-B60	AA		C	
LX-BZ1011ACZZ	50-B03	AA		C	
LX-BZ2073SCZZ	50-B06	AA		C	
LX-BZ4010HC02	50-B59	AA		C	
LX-BZ7007SCZZ	50-B11	AB		C	
LX-BZ7008SCZZ	50-B12	AA		C	
LX-BZ7010SCZZ	50-B61	AA		C	
LX-BZ7011SCZZ	50-B63	AA		C	
LX-BZ7012SCZZ	50-B62	AA		C	
LX-BZ7016SCZZ	50-B64	AB		C	
LX-NZ7001SCZZ	50-N01	AE		C	
[M]					
MHNG-7002SCZZ	7- 3	BC		C	
MLEVP2001SCZZ	14- 438	AC		C	
MLEVP7005SCZZ	4- 9	AD		C	
MSLi-7001SCZZ	1- 27	BA		C	
MSPRC7021SCZZ	6- 13	AC		C	
MSPRC7022SCZZ	8- 3	AB		C	
MSPRC7023SCZZ	4- 4	AE		C	
MSPRC7024SCZZ	4- 10	AE		C	
MSPRC7025SCZZ	4- 8	AB		C	
MSPRC7027SCZZ	1- 5	AB		C	
MSPRP7045SCZZ	1- 47	AH		C	
[N]					
NBLTK7002SCZZ	6- 1	AH		C	
NBRGC2019SCZZ	4- 1	AC		C	
〃	6- 5	AC		C	
NFANP7003SCZZ	1- 36	BE		C	
NPLYZ0043FCZZ	6- 12	AF		C	
NPLYZ2016SCZZ	6- 7	AG		C	
NPLYZ7002SCZZ	6- 2	AP		C	
NPLYZ7003SCZZ	6- 10	AU		C	
NSFTZ7021SCZZ	6- 3	AK		C	
NSFTZ7028SCZZ	1- 6	AG		C	
NSFTZ7036SCZZ	10- 5	AN		C	
[P]					
PF₁LW7001SCZZ	5- 11	BC		C	
PF₁LW7002SCZZ	5- 10	BE		C	
PG₁DH7018SCZD	1- 28	AS		C	
PG₁DM7011SCZZ	1- 10	AK		C	
PGUMS7002SCZZ	1- 7	AE		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
PGUMS7003SCZZ	10- 4	AG		C	
PGUMS7004SCZZ	10- 3	AG		C	
PGUMS7005SCZZ	11- 5	AD		C	
PGUMS7006SCZZ	3- 6	AF		C	
PGUMS7010SCZZ	11- 16	AB		C	
PMiR-7001SCZZ	1- 11	AS		C	
PMiR-7002SCZZ	5- 9	AQ		C	
PMiR-7003SCZZ	4- 5	AR		C	
PMiR-7004SCZZ	10- 11	AR		C	
PMiR-7005SCZZ	10- 6	AR		C	
PSHEF7020SCZZ	3- 5	AE		C	
PSHEZ7004SCZZ	9- 4	AD		C	
PSHEZ7005SCZZ	1- 3	AC		C	
PSHEZ7014SCZZ	3- 1	AW		C	
PSHEZ7024SCZZ	11- 6	AA		C	
PSHEZ7030SCZZ	8- 7	AB		C	
PSHEZ7036SCZZ	12- 13	AH		C	
PSHEZ7043SCZZ	11- 102	AE		C	
PSHEZ7044SCZZ	12- 13	AH		C	
PSHEZ7047SCZZ	1- 34	AF		C	
PSHEZ7085SCZZ	7- 5	AY		C	
PSPAZ7002SCZZ	13- 34	AB		C	
PWiR-7001SCZZ	1- 26	AP		C	
[Q]					
QACCD7611QCZZ	11- 14	AT		B	
QACCV6620QCZZ	11- 14	AV		B	
QCAPC2001RCZZ	2- 4	AD		C	
QCNCM2300SCZZ	18- 1	AB		C	
QCNCM2303SC1C	14- 148	AC		C	
QCNCM2320SC0H	18- 2	AC		C	
QCNCM2320SC1E	18- 3	AD		C	
QCNCM2322SC0D	18- 4	AC		C	
QCNCM2322SC1J	18- 5	AE		C	
QCNCM5022SC2J	19- 1	AG		C	
QCNCM5024SC1F	18- 6	AG		C	
QCNCM5024SC2J	14- 147	AH		C	
QCNCM6834RC2F	14- 146	AH		C	
QCNCM7002SC1F	13- 14	AG		C	
QCNCM7003SC0G	18- 7	AD		C	
//	20- 1	AD		C	
QCNCM7003SC0i	18- 8	AD		C	
QCNCW7004SC0D	5- 13	AB		C	
QCNCW7005SCAJ	18- 9	AV		C	
QCNW-7015SCZZ	21- 1	AD		C	
QCNW-7020SCZZ	1- 37	AP		C	
QCNW-7024SCN1	1- 39	AN		C	
QCNW-7029SCZZ	18- 10	AC		C	
QCNW-7032SCZZ	1- 41	BB		C	
QCNW-7033SCZZ	1- 45	AG		C	
QCNW-7035SCZZ	1- 38	AR		C	
QCNW-7037SCZZ	1- 17	AG		C	
QCNW-7038SCZZ	1- 18	AL		C	
QCNW-7039SCZZ	1- 20	AG		C	
QCNW-7041SCZZ	1- 46	AM		C	
QCNW-7043SCZZ	22- 1	AG		C	
QCNW-7061SCZZ	13- 38	AC		C	
QCNW-7084SCZZ	1- 38	AV	N	C	
QCNW-7085SCZZ	1- 45	AM	N	C	
QCNW-7086SCZZ	1- 46	AG	N	C	
QCNW-7087SCZZ	18- 10	AB	N	C	
QPiN-2005SCZZ	13- 15	AA		C	
//	13- 16	AA		C	
//	13- 32	AA		C	
//	13- 33	AA		C	
QSOCZ6428ACZZ	14- 282	AE		C	
QSW-C9223QCZZ	1- 44	AM		B	
QSW-Z2331RCZZ	14- 424	AM		B	
QSW-Z7006SCZZ	20- 2	AN		B	
[R]					
RCiLZ7004SCZZ	14- 347	AE		C	
RCORF1001ACZZ	1- 40	AK	N	C	
RCORF2002SCZZ	1- 40	AW		C	
RCORF2004SCZZ	1- 43	AM		C	
RCORF7003SCZZ	14- 154	AH	N	C	
RCRSQ2012HCZZ	14- 433	AT		B	
RHET-7001SCZZ	5- 1	AU		B	
RMOTZ7005SCZZ	6- 6	BM		B	
RMPTC8103QCKB	14- 1	AD		B	
//	14- 2	AD		B	
//	14- 3	AD		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
RMPTC8103QCKB	14- 4	AD		B	
//	14- 5	AD		B	
//	14- 6	AD		B	
//	14- 7	AD		B	
//	14- 8	AD		B	
//	14- 9	AD		B	
//	14- 10	AD		B	
//	14- 11	AD		B	
//	14- 12	AD		B	
//	14- 13	AD		B	
//	14- 14	AD		B	
RR-WZ7001SCZZ	9- 12	AL		C	
[S]					
SBNDN0007FCZZ	11- 15	AC		D	
SPAKA7028SCZZ	11- 4	AQ		D	
SPAKA7029SCZZ	11- 2	AQ		D	
SPAKA7030SCZZ	11- 10	AN		D	
SPAKA7031SCZZ	11- 12	AN		D	
SPAKA7032SCZZ	11- 11	AN		D	
SPAKA7035SCZZ	12- 1	AT		D	
SPAKA7043SCZZ	11- 3	AF		D	
SPAKA7044SCZZ	12- 2	AU		D	
SPAKC7027SCZZ	11- 1	AW	N	D	
SPAKC7034SCZZ	12- 5	AY		D	
SPAKC7048SCZZ	12- 5	AN		D	
SPAKC7117SCZZ	11- 1	AW	N	D	
SPAKC7118SCZZ	11- 1	AW	N	D	
SPAKP7026SCZZ	11- 9	AG		C	
SPAKP7046SCZZ	12- 10	AS		C	
SSAKA0003HCZZ	12- 14	AA		C	
SSAKA3001CCZZ	11- 13	AA		D	
SSAKH0021SCZZ	12- 11	AC		C	
[T]					
TCAUH7003SCZZ	12- 6	AC		C	
TCAUH7007SCZZ	11- 17	AD		C	
TiNSE7003SCZZ	11- 101	BL	N	D	
TiNSE7012SCZZ	11- 101	BL	N	D	
TiNSM7011SCZZ	11- 101	BL	N	D	
TLABP7025SCZA	1- 30	AL		C	
TLABZ7029SCZZ	12- 3	AQ		C	
TLABZ7051SCZZ	12- 3	AK		C	
[V]					
VCCCPU1HH5R0D	14- 113	AA		C	
VCEAAU1CW226Q	13- 5	AB		C	
//	13- 7	AB		C	
//	13- 9	AB		C	
//	13- 13	AB		C	
//	14- 16	AB		C	
//	14- 17	AB		C	
//	14- 18	AB		C	
//	14- 19	AB		C	
//	14- 27	AB		C	
//	14- 35	AB		C	
//	14- 44	AB		C	
//	14- 57	AB		C	
//	14- 71	AB		C	
//	14- 76	AB		C	
//	14- 86	AB		C	
//	14- 94	AB		C	
//	14- 104	AB		C	
//	14- 107	AB		C	
//	14- 115	AB		C	
//	14- 118	AB		C	
//	14- 126	AB		C	
//	14- 128	AB		C	
//	14- 130	AB		C	
//	14- 133	AB		C	
//	14- 134	AB		C	
//	14- 135	AB		C	
//	14- 136	AB		C	
//	14- 145	AB		C	
VCEAAU1HW335Q	13- 6	AB		C	
//	13- 12	AB		C	
VCKYPU1HB101K	14- 103	AA		C	
//	14- 109	AA		C	
VCKYPU1HB471K	13- 1	AA		C	
//	13- 2	AA		C	
//	13- 3	AA		C	
//	13- 4	AA		C	
VCKYPU1HF223Z	13- 8	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VCKYPU1HF223Z	14- 15	AA		C	
〃	14- 139	AA		C	
〃	14- 141	AA		C	
〃	22- 2	AA		C	
VCSATU1AE336M	13- 10	AF		C	
〃	13- 11	AF		C	
〃	14- 29	AF		C	
〃	14- 121	AF		C	
VCSATU1CE226M	14- 140	AE		C	
VCSATU1EE106M	14- 138	AE		C	
VCTYPU1NX104M	14- 20	AB		C	
〃	14- 21	AB		C	
〃	14- 22	AB		C	
〃	14- 23	AB		C	
〃	14- 24	AB		C	
〃	14- 25	AB		C	
〃	14- 26	AB		C	
〃	14- 28	AB		C	
〃	14- 30	AB		C	
〃	14- 31	AB		C	
〃	14- 32	AB		C	
〃	14- 33	AB		C	
〃	14- 34	AB		C	
〃	14- 36	AB		C	
〃	14- 37	AB		C	
〃	14- 38	AB		C	
〃	14- 39	AB		C	
〃	14- 40	AB		C	
〃	14- 41	AB		C	
〃	14- 42	AB		C	
〃	14- 43	AB		C	
〃	14- 45	AB		C	
〃	14- 46	AB		C	
〃	14- 47	AB		C	
〃	14- 48	AB		C	
〃	14- 49	AB		C	
〃	14- 50	AB		C	
〃	14- 51	AB		C	
〃	14- 52	AB		C	
〃	14- 53	AB		C	
〃	14- 54	AB		C	
〃	14- 55	AB		C	
〃	14- 56	AB		C	
〃	14- 58	AB		C	
〃	14- 59	AB		C	
〃	14- 60	AB		C	
〃	14- 61	AB		C	
〃	14- 62	AB		C	
〃	14- 63	AB		C	
〃	14- 64	AB		C	
〃	14- 65	AB		C	
〃	14- 66	AB		C	
〃	14- 67	AB		C	
〃	14- 68	AB		C	
〃	14- 69	AB		C	
〃	14- 70	AB		C	
〃	14- 72	AB		C	
〃	14- 73	AB		C	
〃	14- 74	AB		C	
〃	14- 75	AB		C	
〃	14- 77	AB		C	
〃	14- 78	AB		C	
〃	14- 79	AB		C	
〃	14- 80	AB		C	
〃	14- 81	AB		C	
〃	14- 82	AB		C	
〃	14- 83	AB		C	
〃	14- 84	AB		C	
〃	14- 85	AB		C	
〃	14- 87	AB		C	
〃	14- 88	AB		C	
〃	14- 89	AB		C	
〃	14- 90	AB		C	
〃	14- 91	AB		C	
〃	14- 92	AB		C	
〃	14- 93	AB		C	
〃	14- 95	AB		C	
〃	14- 96	AB		C	
〃	14- 97	AB		C	
〃	14- 98	AB		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VCTYPU1NX104M	14- 99	AB		C	
〃	14- 100	AB		C	
〃	14- 101	AB		C	
〃	14- 102	AB		C	
〃	14- 105	AB		C	
〃	14- 106	AB		C	
〃	14- 108	AB		C	
〃	14- 110	AB		C	
〃	14- 111	AB		C	
〃	14- 112	AB		C	
〃	14- 114	AB		C	
〃	14- 116	AB		C	
〃	14- 117	AB		C	
〃	14- 119	AB		C	
〃	14- 120	AB		C	
〃	14- 122	AB		C	
〃	14- 123	AB		C	
〃	14- 124	AB		C	
〃	14- 125	AB		C	
〃	14- 127	AB		C	
〃	14- 129	AB		C	
〃	14- 131	AB		C	
〃	14- 132	AB		C	
〃	14- 137	AB		C	
〃	14- 142	AB		C	
〃	14- 143	AB		C	
〃	14- 144	AB		C	
VHDDSS133HV-1	14- 149	AA		B	
〃	14- 150	AA		B	
〃	14- 151	AA		B	
VHD10D1////-1	14- 152	AD		B	
〃	14- 153	AD		B	
VHERD4.3EB2-1	14- 435	AB		B	
〃	14- 436	AB		B	
VHERD6.2EB2-1	15- 30	AB		B	
〃	16- 23	AB		B	
VHERD6.8E//-1	14- 434	AB		B	
VHH103AT-2/-1	14- 425	AG		B	
〃	21- 2	AG		B	
VHiALS00///-1	14- 188	AG		B	
〃	14- 194	AG		B	
〃	14- 271	AG		B	
〃	14- 327	AG		B	
〃	14- 328	AG		B	
VHiALS02///-1	14- 276	AE		B	
VHiALS04///-1	14- 175	AG		B	
〃	14- 193	AG		B	
〃	14- 225	AG		B	
〃	14- 238	AG		B	
〃	14- 285	AG		B	
〃	14- 286	AG		B	
〃	14- 310	AG		B	
〃	14- 323	AG		B	
〃	14- 336	AG		B	
〃	14- 343	AG		B	
VHiALS08///-1	14- 196	AG		B	
〃	14- 269	AG		B	
〃	14- 335	AG		B	
VHiALS10///-1	14- 270	AG		B	
〃	14- 338	AG		B	
VHiALS11///-1	14- 303	AD		B	
VHiALS138//-1	14- 254	AM		B	
〃	14- 261	AM		B	
〃	14- 268	AM		B	
VHiALS161//-1	14- 187	AH		B	
〃	14- 195	AH		B	
〃	14- 202	AH		B	
〃	14- 210	AH		B	
〃	14- 211	AH		B	
〃	14- 212	AH		B	
〃	14- 243	AH		B	
〃	14- 250	AH		B	
VHiALS244//-1	14- 158	AS		B	
〃	14- 173	AS		B	
〃	14- 182	AS		B	
〃	14- 190	AS		B	
〃	14- 205	AS		B	
〃	14- 213	AS		B	
〃	14- 217	AS		B	
〃	14- 228	AS		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VHiALS244//-1	14- 267	AS		B	
〃	14- 296	AS		B	
〃	14- 297	AS		B	
〃	14- 302	AS		B	
〃	14- 304	AS		B	
〃	14- 311	AS		B	
VHiALS245//-1	14- 172	AW		B	
〃	14- 192	AW		B	
〃	14- 240	AW		B	
〃	14- 265	AW		B	
〃	14- 279	AW		B	
〃	14- 284	AW		B	
VHiALS27///-1	14- 325	AG		B	
〃	14- 337	AG		B	
VHiALS273//-1	14- 176	AL		B	
〃	14- 236	AL		B	
VHiALS32///-1	14- 181	AG		B	
〃	14- 183	AG		B	
〃	14- 200	AG		B	
〃	14- 203	AG		B	
〃	14- 216	AG		B	
〃	14- 218	AG		B	
〃	14- 242	AG		B	
〃	14- 262	AG		B	
〃	14- 290	AG		B	
〃	14- 293	AG		B	
〃	14- 298	AG		B	
〃	14- 342	AG		B	
〃	14- 344	AG		B	
VHiALS373//-1	14- 301	AK		B	
VHiALS374//-1	14- 184	AR		B	
〃	14- 198	AR		B	
〃	14- 209	AR		B	
〃	14- 222	AR		B	
〃	14- 226	AR		B	
〃	14- 234	AR		B	
〃	14- 239	AR		B	
〃	14- 244	AR		B	
〃	14- 245	AR		B	
〃	14- 248	AR		B	
〃	14- 249	AR		B	
〃	14- 251	AR		B	
〃	14- 257	AR		B	
〃	14- 259	AR		B	
〃	14- 266	AR		B	
〃	14- 274	AR		B	
〃	14- 281	AR		B	
〃	14- 287	AR		B	
VHiALS74///-1	14- 231	AK		B	
〃	14- 264	AK		B	
VHiAM0026CN-1	13- 35	AQ		B	
VHiDQ2816A250	14- 260	AY		B	
VHiHM6264ASP1	14- 162	AW		B	
〃	14- 170	AW		B	
〃	14- 189	AW		B	
〃	14- 191	AW		B	
〃	14- 197	AW		B	
〃	14- 199	AW		B	
〃	14- 201	AW		B	
〃	14- 208	AW		B	
〃	14- 214	AW		B	
〃	14- 241	AW		B	
〃	14- 247	AW		B	
〃	14- 273	AW		B	
〃	14- 275	AW		B	
〃	14- 280	AW		B	
〃	14- 288	AW		B	
〃	14- 289	AW		B	
〃	14- 294	AW		B	
〃	14- 295	AW		B	
〃	14- 319	AW		B	
〃	14- 324	AW		B	
VHiiR3K04//-1	14- 321	BE		B	
VHiiR9K08//-1	14- 308	AH		B	
〃	14- 316	AH		B	
VHiiR9311//-1	14- 155	AE		B	
VHiiR9393//-1	14- 341	AE		B	
VHiLH0080B/-1	14- 309	BH		B	
VHiLH232627-1	14- 167	AR		B	
VHiLH235765-1	14- 246	AT		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VHiLH235765-1	14- 292	AT		B	
VHiLM310N//-1	14- 329	AS		B	
VHiLM318///-1	14- 317	AW		B	
VHiLZ91B16/-1	14- 305	AW		B	
VHiLZ92A19/-1	14- 174	AM		B	
〃	14- 204	AM		B	
〃	14- 206	AM		B	
〃	14- 253	AM		B	
〃	14- 272	AM		B	
VHiMA7021//-1	14- 334	AX		B	
VHiMA7022//-1	13- 36	AY		B	
VHiNJM79M06-1	14- 346	AK		B	
VHiSN74S04N-1	14- 263	AG		B	
VHiSN74S240-1	14- 180	AW		B	
VHiSN75160AN1	14- 164	AY		B	
VHiSN75161AN1	14- 163	AY		B	
VHiTCD105C/-1	13- 37	BU		B	
VHiTC5093AP-1	14- 330	AW		B	
VHiTL082///-1	14- 313	AK		B	
VHiTMM2068D55	14- 229	AX		B	
〃	14- 230	AX		B	
VHiTMS9914ANL	14- 171	BE		B	
VHiT74LS14/-C	14- 177	AG		B	
VHiT74LS157-C	14- 160	AF		B	
〃	14- 161	AF		B	
〃	14- 168	AF		B	
〃	14- 169	AF		B	
〃	14- 178	AF		B	
〃	14- 179	AF		B	
〃	14- 185	AF		B	
〃	14- 186	AF		B	
〃	14- 207	AF		B	
〃	14- 215	AF		B	
〃	14- 219	AF		B	
〃	14- 220	AF		B	
〃	14- 221	AF		B	
〃	14- 224	AF		B	
〃	14- 233	AF		B	
〃	14- 255	AF		B	
〃	14- 256	AF		B	
〃	14- 300	AF		B	
〃	14- 306	AF		B	
〃	14- 307	AF		B	
〃	14- 312	AF		B	
〃	14- 315	AF		B	
〃	14- 320	AF		B	
VHiT74LS164-C	14- 278	AG		B	
VHiT74LS283-C	14- 223	AG		B	
〃	14- 227	AG		B	
〃	14- 232	AG		B	
〃	14- 235	AG		B	
〃	14- 252	AG		B	
〃	14- 258	AG		B	
VHiT74LS670-C	14- 291	AL		B	
〃	14- 299	AL		B	
VHiT7406///-C	14- 159	AG		B	
〃	14- 331	AG		B	
〃	14- 339	AG		B	
〃	14- 340	AG		B	
〃	14- 345	AG		B	
VHiT7407///-C	14- 156	AF		B	
〃	14- 157	AF		B	
〃	14- 277	AF		B	
VHiUPD8041271	14- 237	AR		B	
〃	14- 333	AR		B	
VHiUPD8253C-2	14- 314	AR		B	
〃	14- 322	AR		B	
〃	14- 332	AR		B	
VHiUPD8255A-2	14- 165	AQ		B	
〃	14- 326	AQ		B	
VHiUPD8257/-2	14- 318	AT		B	
VHi27128S011E	14- 283	BK		B	
VHPGL4EG5//-1	19- 2	AB		B	
VHPGL4HD5//-1	19- 3	AB		B	
VHPGP1A14//-1	22- 3	AK		B	
VHS2P4MCY//-1	15- 14	AL		B	
〃	16- 30	AL		B	
VRD-HT2EY100J	16- 68	AA		C	
VRD-HT2EY101J	16- 78	AA		C	
VRD-HT2EY102J	16- 70	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VRD-HT2EY103J	16- 81	AA		C	
VRD-HT2EY122J	16- 82	AA		C	
VRD-HT2EY151J	16- 71	AA		C	
VRD-HT2EY153J	16- 66	AA		C	
VRD-HT2EY180J	16- 85	AA		C	
VRD-HT2EY182J	16- 73	AA		C	
VRD-HT2EY220J	16- 87	AA		C	
VRD-HT2EY221J	16- 65	AA		C	
VRD-HT2EY222J	16- 74	AA		C	
VRD-HT2EY223J	16- 72	AA		C	
VRD-HT2EY332J	16- 76	AA		C	
VRD-HT2EY471J	16- 69	AA		C	
VRD-HT2EY561J	16- 80	AA		C	
VRD-HT2EY562J	16- 75	AA		C	
VRD-HT2EY680J	16- 67	AA		C	
VRD-HT2EY822J	16- 83	AA		C	
VRD-HT2HY121J	16- 86	AA		C	
VRD-HT2HY394J	16- 60	AA		C	
VRD-HT2HY560J	16- 62	AA		C	
VRD-HT2HY564J	16- 59	AA	N	C	
VRD-HT2HY6R8J	16- 89	AA	N	C	
VRD-RC2EY101J	14- 373	AA		C	
〃	14- 375	AA		C	
〃	14- 378	AA		C	
〃	14- 379	AA		C	
〃	14- 380	AA		C	
〃	14- 381	AA		C	
〃	14- 383	AA		C	
〃	14- 384	AA		C	
〃	14- 395	AA		C	
〃	14- 400	AA		C	
〃	14- 403	AA		C	
〃	14- 407	AA		C	
VRD-RC2EY102J	13- 17	AA		C	
〃	13- 18	AA		C	
〃	13- 19	AA		C	
〃	13- 20	AA		C	
〃	13- 27	AA		C	
〃	13- 28	AA		C	
〃	14- 382	AA		C	
〃	14- 386	AA		C	
〃	14- 405	AA		C	
〃	14- 416	AA		C	
〃	14- 418	AA		C	
VRD-RC2EY103J	14- 389	AA		C	
〃	14- 394	AA		C	
〃	14- 402	AA		C	
VRD-RC2EY104J	14- 372	AA		C	
〃	14- 417	AA		C	
VRD-RC2EY122J	14- 408	AA		C	
〃	14- 409	AA		C	
〃	14- 410	AA		C	
〃	14- 411	AA		C	
〃	14- 412	AA		C	
〃	14- 413	AA		C	
VRD-RC2EY152J	13- 30	AA		C	
VRD-RC2EY220J	13- 21	AA		C	
〃	13- 22	AA		C	
〃	13- 23	AA		C	
〃	13- 24	AA		C	
〃	13- 25	AA		C	
〃	13- 26	AA		C	
〃	13- 29	AA		C	
〃	14- 396	AA		C	
〃	14- 401	AA		C	
〃	14- 419	AA		C	
VRD-RC2EY221J	14- 352	AA		C	
〃	14- 359	AA		C	
〃	14- 360	AA		C	
〃	14- 361	AA		C	
〃	14- 362	AA		C	
〃	14- 363	AA		C	
〃	14- 364	AA		C	
〃	14- 365	AA		C	
〃	14- 366	AA		C	
〃	14- 367	AA		C	
〃	14- 368	AA		C	
〃	14- 369	AA		C	
〃	14- 370	AA		C	
〃	14- 371	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VRD-RC2EY221J	22- 4	AA		C	
VRD-RC2EY222J	14- 393	AA		C	
VRD-RC2EY223J	14- 353	AA		C	
VRD-RC2EY332J	14- 354	AA		C	
〃	14- 421	AA		C	
〃	14- 422	AA		C	
〃	14- 423	AA		C	
VRD-RC2EY333J	14- 357	AA		C	
VRD-RC2EY471J	14- 358	AA		C	
〃	14- 374	AA		C	
〃	14- 376	AA		C	
〃	14- 391	AA		C	
〃	14- 397	AA		C	
〃	14- 398	AA		C	
VRD-RC2EY472J	14- 355	AA		C	
〃	14- 356	AA		C	
〃	14- 377	AA		C	
〃	14- 399	AA		C	
〃	14- 404	AA		C	
VRD-RC2EY562J	14- 420	AA		C	
VRD-RC2EY621J	13- 31	AA		C	
VRD-ST2EY000J	14- 426	AA		C	
〃	14- 427	AA		C	
〃	14- 428	AA		C	
〃	14- 429	AA		C	
〃	14- 430	AA		C	
〃	14- 431	AA		C	
〃	14- 432	AA		C	
VRD-ST2EY100J	17- 63	AA		C	
〃	17- 64	AA		C	
〃	17- 65	AA		C	
〃	17- 66	AA		C	
〃	17- 67	AA		C	
〃	17- 68	AA		C	
〃	17- 69	AA		C	
〃	17- 70	AA		C	
VRD-ST2EY101J	15- 80	AA		C	
〃	15- 84	AA		C	
VRD-ST2EY102J	15- 65	AA		C	
〃	15- 75	AA		C	
〃	17- 39	AA		C	
〃	17- 43	AA		C	
〃	17- 48	AA		C	
〃	17- 53	AA		C	
〃	17- 58	AA		C	
VRD-ST2EY103J	15- 69	AA		C	
VRD-ST2EY122J	15- 74	AA		C	
VRD-ST2EY151J	15- 79	AA		C	
VRD-ST2EY153J	15- 68	AA		C	
VRD-ST2EY180J	15- 83	AA		C	
VRD-ST2EY182J	15- 73	AA		C	
VRD-ST2EY220J	15- 82	AA		C	
VRD-ST2EY221J	15- 78	AA		C	
VRD-ST2EY222J	15- 72	AA		C	
VRD-ST2EY332J	15- 71	AA		C	
VRD-ST2EY471J	15- 77	AA		C	
VRD-ST2EY472J	17- 60	AA		C	
VRD-ST2EY561J	15- 76	AA		C	
VRD-ST2EY562J	15- 70	AA		C	
VRD-ST2EY680J	15- 81	AA		C	
VRD-ST2EY822J	15- 85	AA		C	
VRD-ST2HY104J	15- 66	AA		C	
VRD-ST2HY121J	15- 64	AB		C	
VRD-ST2HY223J	15- 67	AA		C	
VRD-ST2HY272J	17- 41	AB		C	
〃	17- 42	AB		C	
〃	17- 46	AB		C	
〃	17- 47	AB		C	
〃	17- 51	AB		C	
〃	17- 52	AB		C	
〃	17- 56	AB		C	
〃	17- 57	AB		C	
VRD-ST2HY560J	15- 63	AB		C	
VRNHT2EK1001F	14- 388	AA		C	
〃	14- 406	AA		C	
VRNHT2EK3300F	14- 414	AA		C	
VRNHT2EK3301F	14- 385	AA		C	
〃	14- 387	AA		C	
〃	14- 390	AA		C	
〃	14- 392	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VRNHT2EK56R0F	14- 415	AA		C	
VS2SA673A//-1	14- 348	AD		B	
〃	14- 351	AD		B	
VS2SC3259-/-1	15- 15	AL		B	
VS2SC945///-1	15- 19	AD		B	
VS2SD1195-/-1	14- 349	AH		B	
VS2SD1207-T-1	14- 350	AD		B	
〔X〕					
XBPBZ40P06K00	50-B13	AA		C	
XBPSD30P06KS0	50-B16	AA		C	
〃	50-B44	AA		C	
XBPSD30P08KS0	50-B19	AA		C	
XBPSD30P10K00	50-B21	AA		C	
XBPSD30P10000	50-B50	AA		C	
XBPSD30P30000	50-B14	AA		C	
XBPSD40P06KS0	50-B27	AA		C	
XBPSD40P08KS0	50-B29	AA		C	
XBPSD40P10KS0	50-B30	AA		C	
XBPSD40P14KS0	50-B32	AA		C	
XBPSF30P06000	50-B35	AA		C	
〃	50-B53	AA		C	
XBSSF30P06000	50-B37	AA		C	
〃	50-B52	AA		C	
XBTSC26P04000	50-B40	AA		C	
XBTSC30P08000	50-B54	AA		C	
XBTSF40P06000	50-B42	AA		C	
XCPSD30P06000	50-B18	AA		C	
〃	50-B49	AA		C	
XRESJ20-04000	50-E01	AA		C	
XRESJ40-06000	50-E03	AA		C	
XRESJ60-08000	50-E05	AA		C	
XRESJ70-08000	50-E06	AA		C	
XXXSP30L06000	50-X02	AA		C	
XXXSP40L04000	50-X05	AA		C	
XXXSP40L06000	50-X06	AB		C	
XXXSP40L08000	50-X07	AB		C	
〔0〕					
0CBECD0182ZZ/	16- 99	AQ	N	C	
0CBEDD0295ZZ/	16- 100	AP	N	C	
0CBLBC0152AZ/	16- 22	AE	N	B	
0CBLRZ0297ZQ/	16- 106	AC	N	C	
0CBLRZ0580ZQ/	16- 105	AC		C	
0CBLRZ0670ZR/	16- 101	AD	N	C	
0CBLRZ0671ZR/	16- 102	AW	N	C	
0CBLRZ0672ZR/	16- 103	AH	N	C	
0CBLRZ0673ZR/	16- 104	AG	N	C	
0CBPJC0097ZZ/	16- 97	AE	N	A	
0CBPJC0257ZZ/	17- 15	AG		A	
〃	17- 16	AG		A	
〃	17- 17	AG		A	
0CBPJC0298ZZ/	15- 91	AG		A	
0CBPJC0303ZZ/	15- 92	AE		A	
0CBPJC0358ZZ/	17- 14	AG		A	
0CBPJC0359ZZ/	17- 13	AG		A	
0CBPJC0370ZZ/	15- 90	AF		A	
0CBPJC0437ZZ/	16- 93	AE	N	A	
0CBPJC0448ZZ/	16- 96	AF	N	A	
0CBPJC0449ZZ/	16- 95	AG	N	A	
0CBPJP0012ZZ/	16- 98	AG	N	B	
0CBPJT0106ZZ/	15- 89	AH		A	
0CBPJT0115ZZ/	16- 94	AF		A	
0CBPKZ0137ZZ/	16- 107	AL	N	C	
0CBUAB0011DZ/	17- 25	AM		B	
〃	17- 26	AM		B	
〃	17- 27	AM		B	
〃	17- 28	AM		B	
0CBUAB0038DZ/	15- 20	AK		B	
〃	16- 15	AK		B	
0CBUAC0023CZ/	17- 37	AC		B	
0CBUAC0078CZ/	15- 18	AG		B	
〃	16- 14	AG		B	
0CBUAC0103DZ/	17- 29	AL		B	
〃	17- 30	AL		B	
〃	17- 31	AL		B	
〃	17- 32	AL		B	
〃	17- 33	AL		B	
〃	17- 34	AL		B	
〃	17- 35	AL		B	
〃	17- 36	AL		B	
0CBUAC0117AZ/	15- 16	AT		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
0CBUAC0117AZ/	16- 16	AT		B	
0CBUAC0142AZ/	15- 17	AL		B	
〃	16- 17	AL		B	
0CBUAC0156AZ/	16- 12	AC		B	
0CBUAC0190AZ/	16- 11	AP	N	B	
0CBUAD0029BZ/	17- 38	AK		B	
0CBUAD0039AZ/	16- 13	AG		B	
0CBUBA0004AZ/	15- 24	AB		B	
〃	16- 20	AB		B	
0CBUBA0005AZ/	15- 29	AC		B	
〃	16- 27	AC		B	
〃	17- 9	AC		B	
〃	17- 10	AC		B	
〃	17- 11	AC		B	
〃	17- 12	AC		B	
0CBUBA0022CZ/	16- 21	AD		B	
0CBUBA0022EZ/	16- 19	AC		B	
0CBUBB0087SZ/	15- 21	AN		B	
0CBUBB0107BZ/	15- 28	AL		B	
〃	16- 26	AL		B	
0CBUBB0133BZ/	15- 27	AN		B	
0CBUBB0141AZ/	16- 25	AM		B	
0CBUBB0149DZ/	16- 18	AH	N	B	
0CBUBC0129AA/	15- 26	AF		B	
〃	16- 24	AF		B	
0CBUBC0130AA/	15- 22	AG		B	
0CBUBC0147BZ/	15- 23	AD		B	
0CBUBC0152AZ/	15- 25	AE		B	
0CBUBD0124CZ/	15- 31	AD		B	
〃	16- 29	AD		B	
0CBUBD0133DZ/	15- 32	AD		B	
〃	16- 28	AD		B	
0CBUBD0137EZ/	17- 76	AC		B	
〃	17- 77	AC		B	
〃	17- 78	AC		B	
〃	17- 79	AC		B	
〃	17- 80	AC		B	
〃	17- 81	AC		B	
〃	17- 82	AC		B	
〃	17- 83	AC		B	
〃	17- 84	AC		B	
〃	17- 85	AC		B	
〃	17- 86	AC		B	
〃	17- 87	AC		B	
〃	17- 88	AC		B	
〃	17- 89	AC		B	
〃	17- 90	AC		B	
〃	17- 91	AC		B	
0CBUCH0017ZZ/	15- 12	AX		B	
〃	16- 33	AX		B	
0CBUCH0036ZZ/	15- 11	AW		B	
〃	16- 32	AW		B	
0CBUCZ0097ZZ/	15- 10	AG		B	
〃	16- 31	AG		B	
0CBUCZ0125ZZ/	17- 18	AQ		B	
〃	17- 19	AQ		B	
0CBUCZ0130ZZ/	15- 93	AG		C	
0CBUDC0008AZ/	17- 24	AD		B	
0CBUDC0009BZ/	15- 13	AP		B	
0CBUECC564AB/	15- 62	AB		C	
0CBUEEC2R0AF/	16- 79	AB		C	
0CBUEFD1R2AS/	15- 61	AC		C	
〃	16- 64	AC		C	
0CBUEFD101AF/	17- 59	AC		C	
〃	17- 61	AC		C	
〃	17- 62	AC		C	
0CBUEFE102AH/	17- 40	AD		C	
〃	17- 45	AD		C	
〃	17- 50	AD		C	
〃	17- 55	AD		C	
0CBUEFE102AN/	15- 59	AD		C	
0CBUEFE102AW/	16- 77	AD		C	
0CBUEFE184AH/	15- 60	AC		C	
〃	16- 61	AC		C	
0CBUEFE560AW/	16- 88	AB	N	C	
0CBUEFE681AH/	17- 44	AC		C	
〃	17- 49	AC		C	
〃	17- 54	AC		C	
0CBUEFF683AE/	15- 58	AE		C	
0CBUEFF683AH/	16- 63	AC	N	C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
,BUEZ0013ZZ/	16- 84	AA		C	
0CBUEZ0233ZZ/	17- 71	AD		C	
0CBUFBA102CD/	16- 92	AC		B	
0CBUFBA201AA/	15- 87	AE		B	
0CBUFBA201CD/	16- 90	AC	N	B	
0CBUFBA501CD/	16- 91	AC		B	
0CBUFZ0082ZZ/	15- 88	AE		B	
0CBUFZ0089BZ/	15- 86	AE		B	
0CBUGAB221BU/	15- 42	AD		C	
〃	16- 51	AD		C	
0CBUGAB222BU/	15- 43	AG		C	
〃	16- 58	AG		C	
0CBUGAC331BU/	15- 41	AD		C	
〃	16- 46	AD		C	
0CBUGAD101BU/	15- 40	AD		C	
〃	16- 43	AD		C	
0CBUGAD471BU/	16- 44	AF		C	
0CBUGAD471MPA	15- 39	AE		C	
0CBUGAE100BU/	15- 38	AC		C	
〃	16- 50	AC		C	
0CBUGAE102BU/	15- 37	AF		C	
〃	16- 54	AF		C	
0CBUGAE221BU/	17- 1	AE		C	
0CBUGAE222BU/	15- 36	AK		C	
〃	16- 56	AK		C	
0CBUGAF470BU/	15- 35	AE		C	
〃	16- 41	AE		C	
,BUGAZR47AV/	16- 38	AG	N	C	
0CBUGAZR47AY/	15- 34	AE		C	
0CBUGBQ331AF/	16- 37	AW	N	C	
0CBUGCF102AD/	15- 56	AB		C	
0CBUGCF103AJ/	15- 54	AB		C	
0CBUGCF103BR/	16- 42	AB		C	
0CBUGCF104AR/	15- 57	AC		C	
〃	16- 45	AC		C	
0CBUGCF104AS/	15- 53	AD		C	
〃	16- 55	AD		C	
0CBUGCF332AD/	15- 55	AB		C	
0CBUGCF332BN/	16- 47	AB		C	
0CBUGCQ102AB/	15- 48	AC		C	
0CBUGCQ222AB/	16- 35	AE		C	
0CBUGCZ103AD/	15- 49	AC		C	
〃	16- 53	AC		C	
0CBUGCZ221AA/	15- 51	AB		C	
〃	16- 49	AB		C	
0CBUGCZ222AA/	15- 50	AC		C	
〃	16- 52	AC		C	
0CBUGCZ471AA/	15- 52	AB		C	
〃	16- 39	AB		C	
0CBUGCZ472AE/	15- 47	AE		C	
0CBUGFF104AR/	15- 46	AD		C	
〃	16- 40	AD		C	
,CBUGFM224BA/	16- 34	AR		C	
,BUGFM474BA/	16- 36	AK	N	C	
,BUGFQ563BB/	17- 2	AE		C	
0CBUGZ0238ZZ/	16- 57	AB	N	C	
0CBUGZ0297ZZ/	15- 44	AN		C	
〃	16- 48	AN		C	
0CBUGZ0460ZZ/	17- 3	AN		C	
〃	17- 4	AN		C	
〃	17- 5	AN		C	
0CBUGZ0480ZZ/	15- 45	AG		C	
0CBUGZ0484ZZ/	17- 6	AH		C	
〃	17- 7	AH		C	
〃	17- 8	AH		C	
0CBUGZ0549ZZ/	15- 33	AU		C	
0CBUKZ0022ZZ/	15- 5	AR		C	
0CBUKZ0049ZZ/	15- 8	AG		C	
〃	16- 8	AG		C	
0CBUKZ0057ZZ/	17- 20	AK		C	
0CBUKZ0058ZZ/	17- 21	AQ		C	
〃	17- 22	AQ		C	
〃	17- 23	AQ		C	
0CBUKZ0072ZZ/	16- 7	AY		C	
0CBUKZ0101ZZ/	15- 6	AN		C	
0CBUKZ0105ZZ/	16- 6	AL	N	C	
0CB129800026/	15- 3	AQ		B	
0CB129810104/	17- 73	AX		B	
〃	17- 74	AX		B	
〃	17- 75	AX		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
0CB129810105/	17- 72	AX		B	
0CB129820002/	15- 4	AN		B	
0CB129890116/	15- 1	AW		B	
0CB129890118/	15- 7	AT		C	
0CB130890017/	15- 9	AT		C	
0CB130890018/	15- 2	AX		B	
0CB829690103/	16- 5	AW	N	C	
0CB829690104/	16- 1	AW	N	B	
0CB829820101/	16- 4	AN		B	
0CB829820128/	16- 10	AU		C	
0CB829820149/	16- 3	AR		B	
0CB830690040/	16- 2	AZ	N	B	
0CB830810009/	16- 9	AZ	N	C	